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ABSTRACT

This document contains materials and information used during and developed by a model 2+2 electronics technology program development project conducted by Gainesville High School and Cooke County College, Texas. A procedures manual provides information on grant application, surveys, committees, curricula, articulation agreement, and goals and objectives. Other contents include a description of the problem area, project goals and objectives, timeline, and committee member lists. A labor survey includes results indicating demand for specific types of job skills. A report on student assessment recommends an assessment process in electronics that prevents student failure. Appendixes to this report include results of a textbook readability examination, a profile of the electronics program, sample assessment tracking form, implementation plan, course descriptions, competency profiles, the articulation agreement between the school district and the college, evaluation of the program, classroom layout and equipment list, instructor qualifications, notices of grant awards (1988-89, 1989-90), and minutes of the steering and articulation committee. Syllabi for two courses--DC circuit analysis and AC circuit analysis--provide this information: required texts, terminal and enabling objectives, content outline, methods of evaluation, grades, student conduct, and administrative information. A list of 88 reference texts and promotional materials is also presented. (YLB)

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ELECTRONICS

A Model Program Development Project

Prepared for The

Texas Education Agency

Program Improvement Grant Funded By The Carl D. Perkins Act
Final Product - Project #00420030-58

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Office of Educational Research and Improvement
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Gainesville Independent School District

And

Cooke County College

Gainesville, Texas 76240

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VOCATIONAL EDUCATION PROGRAM IMPROVEMENT PROJECT
ELECTRONICS 2 + 2
GAINESVILLE ISD
PROJECT # 00420030-58

The project reported herein was performed through a contract with the Texas Education Agency under the provisions of the Carl D. Perkins Vocational Education Act (Public Law 98-524). Contractees undertaking such projects are encouraged to express freely their professional judgement in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Texas Education Agency position or policy.

June 30, 1990

Tom Dayton

Signature of Project Director

9-30-90

Date

A Model
2 + 2 ELECTRONICS
Program Development Project

Final Product

Project # 00420030-58

Program Improvement Grant
Fundded By the Carl D. Perkins Act

Prepared For The
TEXAS EDUCATION AGENCY

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PROCEDURES MANUAL FOR 2+2 PROGRAMS

Prepared By:

Gainesville High School
and
Cooke County College

1990

MANUAL OF PROCEDURES

Generic 2 + 2 Project Development

2 + 2 Project refers to a formal articulated curriculum existing between a secondary school and a community college

PREFACE

This Manual of Procedures was developed from the model program development project prepared for the Texas Higher Education Coordinating Board and for the Texas Education Agency by Cooke County College and the Gainesville Independent School District, Gainesville, Texas. This manual is not intended to be the only approach for all two plus two development projects, but rather it is intended to be used only as a general guideline for such development projects.

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Idea of 2 + 2 Project

The beginning of such a project is for a two-year college and the surrounding high schools to meet to determine and discuss methods to help satisfy a demand for skilled employees by currently operating business and industries or a demand for specialists by other employers within the Community College and Independent School District (I.S.D.) service area.

2 + 2 programs should be especially developed in an occupation for which the demand for employment is substantiated and the knowledge and skills are greater than can be met in a secondary program or a two-year post-secondary program alone.

The secondary and post-secondary institutions must determine the need and feasibility of a 2 + 2 project. The primary objectives should be: (1) To develop secondary competency-based occupational training programs/curriculums linked to and in cooperation with two-year post-secondary programs/curricula; and (2) To develop an evaluation, student monitoring, and follow-up system.

In order to determine the need by industries for the employment of the individuals produced by this project, preliminary surveys should be conducted within the college and high school service area.

Applying for Grants

The writing of a grant proposal should be done by each institution to their respective state agency which are, for the college, the Texas Higher Education Coordinating Board, and for the high schools, the Texas Education Agency.

A summary of the grant application should present the proposed project in terms of what the project will accomplish, who will be responsible for carrying out each part of the project, and the general time-lines within which the proposed project will be accomplished.

Upon approval of these grants each institution should hire a coordinator to develop the particular program(s) and assist in developing the articulation agreement.

Conducting Surveys

Labor Market

The faculty and staff of the college should begin a series of workshops to identify, plan, and implement the needed programs; an extensive needs survey should be done among prospective employers to identify their most critical employee skill needs. The results of these surveys can be used to identify several areas of training needs and to begin a systematic approach toward establishing the needed technical/vocational programs.

Student Interest

A survey to determine potential interest in the selected training programs should be presented to public area newspapers. This will generate inquiries from prospective students and public school personnel through the mail, over the telephone, and by personal contact. Inquires from local industries could point to a demand for part-time evening students. Questionnaires of potential interest should also be mailed directly to individuals, to businesses, and to industries.

Committees

The following four committees should be formed with the following types of members and functions of each committee:

STEERING COMMITTEE

Composed of people who have had administrative and/or occupational specialist program director duties. These should be people who have had leadership roles and should come from varied backgrounds in industry, business, and education within the community. The purpose of this committee is to develop plans for implementation of the programs. Responsibilities are to include a full discussion of the project along with its advantages and disadvantages. This committee should also assist with analyzing surveys of local industries and businesses to determine program employment needs and job competencies.

Committees (Continued)

ARTICULATION COMMITTEE

Members should be composed of the college president, college deans, high school superintendents (or high school assistant superintendents), supervisors, school district administrators, department chairpersons, curriculum directors, counselors, and so forth. The purpose of this committee should be to create a document between the college and the high school that will allow the specified discipline to interface with the least amount of trouble and to be the most efficient.

FACILITIES AND EQUIPMENT COMMITTEE

This committee should consist of department chairpersons, business managers, maintenance directors, etc. The purpose of this committee should be to plan equipment and facilities requirements for the program(s). Proposals and recommendations from vendors and contractors should be received and decided upon by this committee.

EVALUATION COMMITTEE

This committee should be made up of occupational/technical deans and secondary curriculum specialists. The purpose of this committee should be to evaluate the program(s) for curriculum quality, appropriateness of classroom and laboratory space and equipment, student access to the program, quality of promotional literature, and degree of involvement of external agencies. Evaluation criteria should be listed on a high-low scale for committee evaluation and determination.

The project coordinators should go directly to the chief executive officer of businesses, industries, and other employers within the discipline area in search of committee members. This will allow selection of committee members who can easily arrange time off from employment if necessary for committee activities. This will also encourage a more active participation by the employers as a whole.

Committee meetings should be scheduled on different evenings for different committees, thus reducing mis-communication between committee members, especially if an individual were to serve on more than one committee.

Texas Government

Correspondence

The Texas Higher Education Coordinating Board and Texas Education Agency will each assign a grant manager and coordinating board/agency representative for the articulation committee. These representatives should be informed of all meetings and activities planned for the committee.

2 + 2 Users Group meetings will be held in Austin, Texas, periodically. These meetings should be attended by both representatives of the college and representatives of the independent school district involved. These meetings are a valuable resource of information based on other existing and developing 2 + 2 programs. Nation-wide Tech Prep Workshops are also an excellent source of information and advice in the process of forming 2 + 2 programs.

Curricula

Curriculum development with competency-based instruction requires the development of appropriate competencies derived from industry involvement. Those identified competencies must then be allowed to drive the curriculum.

Competency Profile

Distribute a master list of competencies for the determined program of study, which can be obtained from the federal government, to all committee members. Ask these members to rank the competencies. Members without technical backgrounds should forward their list to someone within their company with technical knowledge and ask them to rank the competencies. Design the specific programs of study based on the results of the ranked competency list.

College Programs should be designed so that everything offered by the high school programs should also be offered at the college for students who come from high schools where the determined programs are not offered or for adults from the work force who wish to enter the programs on either a full or a part-time basis. Evening classes should be offered to accommodate students employed during the day.

Curriculums (Continued)

Institutions that will have existing programs of the 2 + 2 disciplines will need to do a self-study to ensure that state of the art is included in their program prior to undertaking the development of an articulation agreement. Insist on quality of facilities, equipment, students, and faculty.

Student Assessment

To insure success of students in completing these programs of study, a well-designed assessment program and careful placement should be utilized.

Definitions

Articulation

2 + 2 programs are articulated, competency-based, technical-vocational curricula jointly designed by business, secondary, and post-secondary institutions linking the last two years of secondary education with the first two years of post-secondary education to produce a strong curriculum containing competencies not possible to achieve in only two years.

The Center for Occupational Research and Development (CORD) in Waco, Texas, expands on the definition of articulation by saying it can be characterized as a process, an attitude, and a goal. As a process it is the coordination of policies and practices among sectors of the education system to produce a smooth flow of students from one sector to another. As an attitude, it is exemplified by the willingness of educators in all sectors to work together to transcend the individual and institutional self-interest that impedes the maximum development of the student. As a goal, it is the creation of an educational system without artificial divisions, so that the whole education period becomes one unbroken flow, which varies in speed for each individual, and which eliminates loss for credit, delays and unnecessary duplication of effort.

Articulated Credit - refers to post-secondary credit awarded to an individual student for having successfully completed a specified approved course at a secondary school under the authority and guidelines of an Articulation Agreement. The credit will be held in escrow until the student meets all of the applicable stipulations of said agreement.

Concurrent Credit - refers to post-secondary credit awarded to high school students under the college's early admissions program.

Articulation Agreement

The purpose of an articulation agreement is to provide a mechanism through which vocational/education programs at the high school and vocational/technical education programs at the college will interface, thereby granting students who have mastered agreed-upon task competencies in these programs at the high school to receive post-secondary credit for them at the college.

Suggested Format for an Articulation Agreement

Articles of Agreement

A. Articles

1. The articulation agreement will become effective upon approval by the President of the college and the Superintendent of the independent school district.

2. College and ISD representatives, including members of their respective administrative and teaching staff, will meet on a semi-annual basis for the purpose of making recommendations to improve and update the conditions of the agreement.

3. College and ISD representatives will establish an Advisory Committee consisting of members from business, industry and industrial counsels to assist in the continued development of the 2 + 2 program(s).

4. Students will not be charged for articulated credit earned under this agreement at the high school. After successfully completing six hours of credit at the college and at the student's request, the transferred articulated credit will be recorded on the college's official records.

5. Students enrolling in concurrent credit must meet all provisions of the college's early admissions program and must pay applicable tuition and fees at registration.

6. Competency Profiles will be maintained in a permanent file for credit earned under this agreement.

7. Approved courses taught by both institutions will have common syllabi, competencies, and standards.

A. Articles (Continued)

8. Credit earned at the high school under this agreement is valid and transferrable to the college for a period of five years from the date of a student's graduation from the high school.

9. All new faculty and administrators involved with this Articulation Agreement will receive in-service training on the agreement.

10. Both parties agree to make every effort possible to ensure that students in the process will be provided reasonable opportunities to successfully complete the program. Petition to end this agreement must be submitted no less than one year in advance of the intended date of termination..

11. The petition must be submitted in writing and signed by the college president or the high school superintendent making the petition.

12. The petition must be delivered to the second party to the agreement. Delivery of the intent to terminate will constitute formal notification and will serve as grounds for termination one year following the date of delivery.

B. List courses eligible for articulated credit.

C. List courses eligible for concurrent credit.

D. Eligibility of Students

1. Students enrolled in the high school may enroll in the programs under the following conditions:

   a. Enrolled in good standing.
   b. Enrolled in grade Level† 11 or above.
   c. Have successfully completed the program assessment test.
   d. Have secured the approval of the high school counselor.

† per Tom Loftin 10/8/90

D. Eligibility of Students (Continued)

2. Students enrolled in the Community College may enroll in the programs under the following conditions.

   a. Enrolled in good standing.
   b. Have successfully completed the program assessment test.
   c. Have secured the program department counselor's approval.

3. The general public may enroll in the programs under the following conditions:

   a. Satisfy existing entrance requirements of the community college.
   b. Have successfully completed the program assessment test.
   c. Have secured the program department counselor's approval.

E. Authentication

This document is accepted as the 2 + 2 Program Articulation Agreement existing between the Community College and the Independent School District.

The document should be signed by the President of the community college and the Superintendent of the independent school district.

Research Other Institutions

The project coordinators and instructors of the determined programs from the Community College and from the Independent School District should call upon and/or visit other institutions to gather more information on existing 2 + 2 agreements, existing project grants, existing programs of study, and existing facilities and equipment.

Goals and Objectives

Suggested types of goals

1. To prepare students for gainful employment in the determined field of study.

2. To prepare students for future growth as the technologies advance and change.

3. To develop a fully integrated 2 + 2 Articulated Program between the community college and the high school.

4. To establish linkage between all segments of industry, business and education.

5. To impact on education in general by providing a mechanism to reduce the drop-out rate at secondary and post-secondary schools.

Suggested types of objectives

1. A competency-based curriculum developed by a steering committee consisting of members from business, industry, and education.

2. To plan for and select state-of-the-art equipment and facilities with the aid of subject matter experts.

3. To develop a criterion-referenced assessment system that will provide aptitude values for screening students.

4. To develop an Articulation Agreement between the community college and the independent school district that will reduce or eliminate repetition in course materials.

5. To seek approval for the start up of this program from the Coordinating Board and Education Agency.

6. To complete the implementation plan starting at a determined time.

PROBELM AREA TOWARD WHICH THE PROJECT WAS DIRECTED

The 2+2 project will provide training that will lead to employment opportunities that will satisfy industry needs and requirements for entry level electronics technicians and specialists.

"2+2 Project" will be used throughout this document in lieu of the official title, "A Model 2+2 Electronics Technology Program Development Project". The 2+2 Project is a joint venture by Cooke County College and Gainesville Independent School District to develop an Articulation Agreement and an Electronics Programs to support the agreement.

Other secondary and post-secondary institutions have developed quality articulation agreements designed to reduce repetition of the same course materials, and accelerate a student through the educational and training process.

The major advantage and uniqueness of the planning, development and implementation procedures in this document is the fact that neither institution had an Electronics Program, nor faculty with the necessary subject matter expertise to develop the program.

The first step taken by the two institutions to bring about the culmination of their dream was to agree to determine the need and feasibility of the project.

A preliminary survey was conducted in Cooke County College service area, Cooke, Denton, and Montague Counties, which indicated a strong need by industries in the service area for electronics technicians.

The second step in this process was the writing of a grant proposal by each institution to their respective state agencies. After approval of grants from the Texas Education Agency, and the Texas Higher Education Coordinating Board, each institution hired a Coordinator to develop the Electronics Program, and the Articulation Agreement.

Graduates of the program can expect to acquire gainful employment at currently operating electronics related industries as well as new electronics manufacturing firms presently under construction in the Cooke County College and Gainesville Independent School District service area.

The project has been coordinated and developed under the guidelines of each grant. Funding for both grants was provided by the Carl D. Perkins Act.

Records, results, and accomplishments of the development of this project can be found throughout this document.

A MODEL 2 + 2 ELECTRONICS TECHNOLOGY PROGRAM DEVELOPMENT PROJECT

GAINESVILLE HIGH SCHOOL & COOKE COUNTY COLLEGE

GOALS AND OBJECTIVES

GOALS:

The goals of the Electronics program are as stated below:

1. To develop a fully Articulated Model 2+2 Electronics Technology Program that will serve as a guide for secondary and post-secondary institutions wishing to develop similar articulated programs.
2. To prepare students for gainful employment in the high tech field of Electronics.
3. To prepare students for future growth as the technologies advance or change.
4. To develop a fully integrated 2+2 Articulated Electronics Program between Gainesville High School and Cooke County College.
5. To establish linkage between all segments of industry, business and education.
6. To impact on education in general by providing a mechanism to reduce the drop-out rate at secondary and post secondary schools.

OBJECTIVES:

The goals of this project have been or are expected to be successful through a series of objectives stated below:

1. A competency based curriculum developed by a steering committee consisting of members form industry, business and education.
2. To plan for and select state-of-the-art equipment and facilities with the aid of subject matter experts.
3. To develop a criterion referenced assessment system that will provide aptitude values for screening students.
4. To develop an Articulation Agreement between Gainesville High School and Cooke County College that will reduce or eliminate repetition in course materials.
5. To seek approval for the start up of this program from the Texas Higher Education Coordinating Board.
6. To complete the implementation plan starting Fall '89.

TIMELINE OF EVENTS

Timeline of events related to the submission of an application to the Coordinating Board for approval of an Electronics Technology Program and Electronics Engineering Technology program option at Cooke County College.

MONTH DAY YEAR	EVENT
Fall, 1986	Cooke County College President initiates action to determine educational and training needs most desired by area business and industries.
Fall, 1986	Board of Trustees conducts a series of workshops to develop a plan of action for new program development.
Spring, 1987	Massive Needs Survey done among area employers to determine greatest potential for new program development.
Summer, 1988	Cooke County College and Gainesville ISD jointly agree to develop a model 2+2 Electronics Program.
November 21, 1988	Mr. Arvel Joe Shults employed as the Coordinator for the Model 2+2 Electronics Technology Program Development Project
November 23, 1988	Project coordinator visited with personnel associated with the Electronics Technology program at Grayson County College, Denison, Texas.
November 29, 1988	Joint meeting of personnel from Gainesville I.S.D. and Cooke County College to discuss project objectives. GISD representatives indicated that Jack Smith would be employed at the beginning of the spring semester to coordinate the program development activities of their school system.
December 1, 1988	Joe Shults completed a first review of electronics programs catalog listings for other community colleges within the State of Texas and selected colleges outside the state.
December 5, 1988	Completed the "first draft" of a conceived curriculum model for Electronics Manufacturing Technology and Electro-Mechanical Technology. These documents are to be utilized to establish basis for discussions with the steering and articulation committees.
December 7, 1988	Joe Shults began calling on local businesses and industries to acquaint them with the project and to develop a prospective membership list for the articulation and steering committees.
December 8, 1988	Shults visited with Dale Alsup of Cooke County College and personnel from Grayson County College concerning program math requirements. Sample texts were ordered.
December 9, 1988	Completed initial Electro-Mechanical program documentation and delivered same to Whitten Williams, program director, for consideration and suggestions.

December 12, 1988	Reviewed specifications for equipment to be utilized in a model electronics laboratory. Vendors contacted were: Michael Tracy (Lab-Volt Systems), Mark Robinson (Technology Training Consultants), Owen Savage (Teaching Systems, Inc.) and Bruce Buehler (Technical Laboratory Systems, Inc.)
December 14, 1988 through December 31, 1988	Continued to develop materials for activation of the steering and articulation committees.
January 3, 1989	Mr. Jack Smith comes on board as the coordinator for the high school portion of the 2+2 project.
January, 1989	Visited numerous educational institutions and businesses to develop relations for implementing articulation and steering committees.
February, 1989	Constructed a data base of competencies for steering committee members to use in developing course objectives for each of the proposed electronic courses.
February 22, 1989	Activated Articulation and Steering Committees in a combined session and briefed the Committees on the requirements of the Grant. Discussed labor market survey and established industry need for the program. Implemented survey of competency profiles needed by those industries. Industries represented by committees are listed on the committee assignment document. Committee members voiced a strong desire to change the emphasis in the two programs to a strong general technology base with options for Engineering Technology.
March 29, 1989	Articulation and Steering Committee meeting to discuss proposed program and Articulation Plan. Steering Committee approved proposed curriculum for Electronics Technology Program and Electronics Engineering Program.
April 11, 1989	Lab-Volt made equipment presentation.
April 19, 1989	Teaching Systems made equipment presentation.
April 20, 1989	Technology Training Consultants made equipment presentation.
April 28, 1989	Technical Laboratory Systems, Inc. made equipment presentation.
May 3, 1989	Articulation Committee Meeting to discuss the Articulation Plan. Articulation plans approved will be signed by Dr. Joyner and Mr. Usefton.
May 9, 1989	Drs. Kenneth Washburn and Doug Keenan met for consultation and recommendation of equipment and facilities.
May 10, 1989	Dr. Jerry Moorman provided a formal recommendation for the Assessment Instrument for the program
May 10, 1989	The Gainesville Board of Education approved the 2+2 Electronics Program Articulation Agreement between Cooke County College and Gainesville I.S.D.

May 15, 1989	Cooke County College Board of Trustees approved the Electronics Program and authorized Dr. Joyner to sign Articulation Agreement.
May 18, 1989	Les Stewart met and surveyed needs for facilities/equipment and provided a recommendation.
May 19, 1989	Administrative review of 2+2 Final Product.
May 22 & 23, 1989	Evaluation Committee Meeting to discuss the mechanics of 2+2 Program for the Gainesville High School and Cooke County College.
May 24, 1989	Facilities and Equipment Sub-Committee Meeting to discuss vendor presentations and proposals. Facilities and Equipment evaluation priority and recommendations were discussed.
May 25, 1989	Evaluation Committees recommendations incorporated into Degree Plans and final product.
May 26, 1989	Draft copy of Electronics Program sent to Texas Higher Education Coordinating Board for review and approval.
May 31, 1989	Draft copy of Final Product sent to Texas Higher Education Coordination Board for review and approval.

TIMELINE OF EVENTS (Con't)

June 30, 1989	Joe Shults resigns as coordinator of 2+2 project at CCC.
August 15, 1989	James Yerks is employed and comes on board at CCC as instructor/coordinator for the 2+2 project.
August-September, 1989	Implementation of programs begins at CCC and GISD respectively.
October 12, 1989	Meeting of CCC and GISD officials and 2+2 staff to discuss progress to date and other various aspects of the program in general.
January 5, 1990	Meeting of CCC and GISD officials and 2+2 staff to discuss progress to date and other various aspects of the program in general.
March 15, 1990	Advisory Committee Meeting to discuss program revisions and Manual of Procedures.
June 29, 1990	Manual of Procedures by CCC and GISD staff is officially presented to Texas Higher Education Coordinating Board.

2+2 COMMITTEE ASSIGNMENTS

	ARTICULATION	STEERING
Luther Bud Joyner	X	X
Charles Uselton	X	X
Joe Shults	X	X
Jack Smith	X	X
Whitten Williams	X	X
Tom Loftin	X	X
Thomas J. Risinger	X	X
Eduardo Gaytan	X	X
Therril Valentine		X
Kenneth Washburn		X
Doug Keenan		X
Margaret Duncan	X	
Dale Alsup	X	X
Clyde Yeatts	X	
Jim Fletcher		X
Carl Smith		X
Patty Gilbert	X	
Greta Miller	X	
Frank Fuller	X	
Bill McCarley	X	
Mike Martin	X	
Jo Anne Smith	X	
Terry Tuck		X
George Pavelek	X	X
Glenn Stockard		X
Barry Payne		X
Jim Calhoun		X

ARTICULATION COMMITTEE
A MODEL 2+2 ELECTRONICS
PROGRAM DEVELOPMENT PROJECT

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COOKE COUNTY COLLEGE

1525 W CALIFORNIA • GAINESVILLE, TX 76240 • 817/668-7731 • METRO 430-0352

March 30, 1987

Personnel Director

Human Resource Assessment

One of the most important resources to a business is a pool of well-trained workers from which they can select their employees. A key to having these well-trained workers is knowing which skills are needed by the businesses.

Cooke County College is in the process of compiling information on training opportunities available for economically or educationally disadvantaged adults in the North Texas area. Through a grant by the Coordinating Board of the Texas College and University System, we are locating these adults in Cooke, Denton, and Montague counties and referring them to various training programs.

You can be of assistance to us in this endeavor by completing the enclosed questionnaire. Through this survey, we are attempting to assess the human resource needs of the area for the next five years. We feel that this information from you will help us in directing not only disadvantaged adults, but also students to training for skills which are and will continue to be in demand. This process will help to establish that pool of well-trained workers from which you can choose your employees for the coming years.

I must stress that we are not acting as an employment agency. Your responses will be kept entirely confidential. The questionnaires will be processed by personnel at Cooke County College and summarized in statistical form. At no time will a potential employee be referred to your firm for employment based on your answers to this questionnaire.

Additionally, the Small Business Development Center (SBDC) at Cooke County College has included a few questions designed to assess human resource development needs in this area. The SBDC is in the process of planning program offerings for the training and development of employees for firms such as yours. Your input as to your areas of interest is greatly appreciated.

Thank you for taking the time to complete the questionnaire. If you have any questions about either the questionnaire or the project, please feel free to call me. We all must work together to meet the human resource needs of our area.

Sincerely,

Alicia Briney

Alicia Briney

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HUMAN RESOURCE ASSESSMENT

This questionnaire is designed to obtain information that can help your organization improve its human resource training efforts and to match your human resource needs with the skills of the labor force in the community.

If the results of this questionnaire are to be helpful, it is important that each question be answered thoughtfully and frankly.

There are no right or wrong answers. Your answers will be kept in the strictest confidence.

I. YOUR BUSINESS

A. What is the nature of your business?

_____ Retail
_____ Service
_____ Wholesale
_____ Manufacturing

B. What are your principal products or services? _____

_____

II. YOUR WORKFORCE

A. Please check the blank which corresponds to the approximate number of full-time employees you have (or anticipate having) on your payroll at this location:

	Less than 10	11-50	51-100	101-150	151-200	201-250	Over 250 (Please specify
Currently	___	___	___	___	___	___	___
In one year	___	___	___	___	___	___	___
In three years	___	___	___	___	___	___	___
In five years	___	___	___	___	___	___	___

B. Approximately how many of your full-time employees are in the following types of occupations?

	Less than 10	11-50	51-100	101-150	151-200	201-250	Over 25 (Please specify
Professional	___	___	___	___	___	___	___
Managerial	___	___	___	___	___	___	___
Sales	___	___	___	___	___	___	___
Clerical	___	___	___	___	___	___	___
Skilled Labor	___	___	___	___	___	___	___
Unskilled Labor	___	___	___	___	___	___	___
Other	___	___	___	___	___	___	___

III. TRAINING OF EMPLOYEES

A. Generally speaking, do new entry level workers that you employ have sufficient training to meet your needs? _____ Yes _____ No

If no, briefly describe your major training needs: _____

_____

_____

B. Do your employees require any "special training"? _____ Yes _____ No

If yes, how is this training usually accomplished?

_____ On-the-Job Training
_____ Vocational Technical Training
_____ Other (Please Specify _____)
_____ Company Training and Development Department

C. Does your company use outside sources for training?
_____ Yes _____ No

If no, would your company consider using outside sources for training in the future? _____ Yes _____ No

If interested, where would you prefer the training to be held?
_____ On-site facility _____ College campus
_____ Other (Please specify _____)

D. Which of the following provisions does your company make for employees pursuing training or development? _____ leave time
_____ tuition reimbursement _____ other (_____)
_____ no provisions are made

E. Please check the educational level required of employees in the following types of occupations in your company.

	H.S. Equivalent	Vo-Tech Training	Specialized Training	2 Year College Degree	4 Year College Degree	No Educ Requirement
Professional	____	____	____	____	____	____
Managerial	____	____	____	____	____	____
Sales	____	____	____	____	____	____
Clerical	____	____	____	____	____	____
Skilled Labor	____	____	____	____	____	____
Unskilled Labor	____	____	____	____	____	____
Other	____	____	____	____	____	____

F. Over the next two to three years, do you anticipate needing workers who are either better or differently trained from those you currently employ? _____ Yes _____ No

If yes, briefly describe the additional training needs you anticipate: _____

_____

_____

_____

_____

_____

G. If we have failed to ask a question concerning an aspect of training employees in your company, please feel free to comment. (Attach additional pages if necessary.) _____

_____

_____

_____

_____

_____

IV. THE SMALL BUSINESS DEVELOPMENT CENTER

The SBDC provides specific courses for the purpose of training and developing employees. Please check the following courses to indicate your interest for personnel training and development in the future.

A. MANAGEMENT

_____ Management and Supervision
_____ Time Management
_____ Problem Solving and Decision Making
_____ Organizational Development
_____ Improved Business Meetings
_____ Motivation
_____ Customer Relations
_____ Human Relations
_____ Marketing
_____ Quality Control
_____ Personnel Management
_____ Delegation
_____ Team Building
_____ Leadership
_____ Evaluation and Performance Appraisals
_____ Employer Protection (EEOC)
_____ Motivation
_____ Other (_____)

B. COMPUTER/DATA PROCESSING

_____ Introduction to Computer Science
_____ BASIC
_____ Assembler Language
_____ Word Processing
_____ Data Base
_____ Spread Sheets
_____ PC Networking
_____ RPG
_____ Fortran
_____ COBOL
_____ Other (_____)

C. BUSINESS

_____ Accounting
_____ Bookkeeping
_____ Career Assessment
_____ Career Development
_____ Filing and Record Keeping

C. BUSINESS CONTINUED

_____ Manuscript Preparation
_____ Office Management
_____ Office Procedures
_____ Typing
_____ Shorthand
_____ Proofreading
_____ Business Math
_____ Other (_____)

D. COMMUNICATIONS

_____ Business Writing
_____ Technical Writing
_____ Interviewing
_____ Public Speaking
_____ Reading Skills
_____ Nonverbal Communications
_____ Effective Listening
_____ Assertiveness Training
_____ English (2nd Language)
_____ Managing Conflict
_____ Creativity
_____ People Skills
_____ Telephone Techniques
_____ Other (_____)

E. TECHNICAL

_____ Machine Shop
_____ Video Technology
_____ Drafting
_____ Construction Technology
_____ Electronics
_____ Electricity
_____ Engineering
_____ Food Service
_____ Automotive Mechanics
_____ Fashion Marketing
_____ Welding
_____ Diesel Mechanics
_____ Air Conditioning/Refrig.
_____ Apparel Design

F. CORPORATE WELLNESS

_____ Weight Control
_____ Nutrition
_____ Jogging/Running
_____ Relaxation Techniques
_____ Health Promotion
_____ Lifestyle Planning
_____ Stress Management
_____ Smoking Cessation
_____ Health Assessments
_____ Aeorbics
_____ Fitness/Exercise
_____ Behavior Modification
_____ First Aid/CPR
_____ Other (_____)

V. THE FOLLOWING QUESTIONS ARE DESIGNED TO ASSESS YOUR INTEREST IN THE SERVICES OFFERED BY THE SBDC.

A. The SBDC provides free counseling to eligible businesses. Counseling is done by businessmen from SCORE (Service Corps of Retired Executives) and ACE (Active Corps of Executives). Would you be interested in receiving free counseling from the SBDC?

_____ Yes _____ No

B. The SBDC also provides information concerning several aspects of business. Please check the following topics to indicate your interest in receiving a publication concerning that topic.

_____ Financial Management and Analysis
_____ General Management and Planning
_____ Crime Prevention
_____ Marketing and Sales
_____ Personnel Management
_____ New Products/Inventions/Ideas
_____ Starting and Running a Business
_____ Recordkeeping and Taxation
_____ Purchasing and Inventory Control
_____ Legal and Risk Management
_____ Government Procurement
_____ Micro Computer Use

C. Soon the SBDC will have a counselor on staff to help businesses with the regulations involved in bidding for government contracts. Would you be interested in this service?

_____ Yes _____ No

D. Would you like the SBDC director to contact you in regard to any of its services? _____ Yes _____ No

Would you like to receive a copy of the results of this study?

_____ Yes _____ No

If yes to either of these questions, please indicate your name, phone number, and mailing address below:

Name _____

Address _____

_____

Phone Number _____

LABOR MARKET PROJECTIONS FOR COOKE, DENTON, AND MONTAGUE COUNTIES

During the period of March through June 1987, surveys were mailed to businesses in Cooke, Denton, and Montague Counties. The purpose of this survey was to determine the demand for specific types of job skills in this area for the next five years. The names and mailing addresses of the businesses were obtained from the County Tax Appraiser in each of the three counties. An initial mailing and a follow-up mailing yielded 105 usable responses to the questionaire. The businesses responding to the questionaire are listed in Appendix A. The results of the survey will be summarized in the following sections.

NUMBER OF RESPONDENTS FROM EACH COUNTY

The survey was returned by 50 businesses in Cooke County (47.6 percent), 37 businesses in Denton (35.2 percent), and 18 businesses in Montague (17.1 percent). The strong response from Cooke County appears to indicate a sincere interest in working with training institutions to develop a work force with marketable skills.

TYPES OF BUSINESSES RESPONDING TO THE SURVEY

Of the businesses responding to the questionaire, 21 (20 percent) were retailing establishments, 38 (36.2 percent) were service providers, 8 (7.6 percent) were wholesalers, and 38 (36.2 percent) were manufacturers. The disproportionate number of manufacturers represented in the survey is the result of an attempt to encourage all manufacturing firms within the three counties to respond to the questionaire. The reason for this oversampling is that manufacturing firms usually employ a greater number of people than do the other three major types of businesses.

The businesses were also asked to identify their principal products or services in an open-ended question. The responding businesses represented a wide variety of industry classifications. The results of this question are summarized in Appendix B.

NUMBER OF EMPLOYEES

Over half of the respondents currently employ less than 10 people in their businesses. Approximately one-fourth reported employing 51-100 workers. Only 12 percent of the sample employs more than 100 workers.

The projected number of employees for firms in the sample were estimated by the respondents for one year, three years, and five years. The projected number of employees for next

year was less than 10 for 50 percent of the sample. Firms projecting 11-50 employees next year made up 25 percent of the sample. However, firms projecting number of employees to be in the 51-100 range increased 5 percent over reported number of workers currently employed at the firm. The projections of the sample for the estimated number of workers to be employed in three years and in five years remained relatively stable. Based on the estimations of the respondents, it appears that the three county area will not experience a significant increase in the number of employees needed over the next five years. Any increase will come from the opening of new businesses in the area, such as the Texas Instruments plant scheduled to open in the Denton area within that time frame.

MAKE-UP OF THE CURRENT WORKFORCE

Respondents were asked to indicate the approximate number of employees currently working in several occupational categories. The responses to this question are depicted below.

Professional Employees:

51.4 percent (54) have less than 10 professional employees

4.8 percent (5) have 11-50 professional employees

One business has 201-250 professional employees

42.9 percent (45) report having no professional employees

Managerial Employees:

67.6 percent (71) have less than 10 managerial employees

12.4 percent (13) have 11-50 managerial employees

One business has 201-250 managerial employees

19 percent (20) report having no managerial employees

Sales Employees:

53.3 percent (56) have less than 10 salespeople

5.7 percent (6) have 11-50 salespeople

One business has 51-100 salespeople

40 percent (42) report having no salespeople

Clerical Employees:

67.6 percent (71) have less than 10 clerical workers

6.7 percent (7) have 11-50 clerical workers

2.9 percent (3) have 51-100 clerical workers

21 percent (22) report having no clerical workers

Two businesses report having more than 100 clerical workers

Skilled Employees:

56.2 percent (59) have less than 10 skilled employees

17.1 percent (18) have 11-50 skilled employees

Three businesses report having more than 100 skilled employees

23.8 percent (25) report having no skilled employees

Unskilled Employees:

31.4 percent (33) have less than 10 unskilled employees

18.1 percent (19) have 11-50 unskilled employees

3.8 percent (4) have 51-100 unskilled employees

Three businessess report having more than 100 unskilled employees

43.8 percent (46) report having no unskilled employees

TRAINING OF EMPLOYEES

The respondents were asked whether they felt the workers receive sufficient training to meet the business's needs. Sixty respondents (57.1 percent) answered that the employees do get sufficient training. Forty respondents answered that the training is not sufficient.

The businesses who responded "no" to this question were asked to elaborate on what their major training needs are at this time. The results of this open-ended question are summarized as follows:

Data Processing
Business Math
Sales and Marketing
Personal Management
Meat Market Management
Produce Management
Retail Management
Working With Hazardous Products (LPG)
Checkers, Store Clerks, Package Clerks
Nursing Aides
Welders
Machinists
Drafting
Mechanics

Typing
Adding Machine
Word Processing
Spelling
Letter Writing
Phone Courtesy
Typesetting/Printing Skills
Purchasing
Computer Skills
Electricity Knowledge
Solid-state Electronics
Satellite Systems
Tools
Reading Blueprints
Bookkeeping
Filing
Craft Skills
Silk Screening
Sewing
Early Childhood Educational Training
Automotive Electronics
Design (drafting)
Fiberglass Repair

The skills mentioned most frequently include: 1) sales and marketing, 2) machinists, 3) welders, 4) handling of hazardous materials (LPG), 5) computer skills, 6) word processing, 7) retail-related managememt skills, and 8) various types of electronic skills.

In addition to specific job skills mentioned, the respondents also named general business skills which are lacking in current employees. These skills include honesty, promptness, customer relations, time management, and good attitude. These skills were mentioned by a significant number of the respondents.

The survey also asked if employees of the respondent's company require any special training. Eighty-five respondents

(81 percent) answered that special training is required. Only 17 respondents (16.2 percent) answered that none is required.

If respondents answered that special training is required in the previous question, they were then asked how this training is usually accomplished. Seventy-seven respondents (73.3 percent) reported that they accomplish this special training through on-the-job training. Only six respondents (5.7 percent) reported that they use vocational-technical training. Four companies use an in-house training department and three companies use other methods for special training.

EDUCATIONAL REQUIREMENTS FOR JOB CATEGORIES

The respondents were also asked to report the level of education required for each of the job categories in their company. The results of this question are summarized below.

Percentage of Job Category Requiring:

High School Equivalent:

Professional Employees	8.6%
Managerial Employees	14.3%
Salespeople	21.0%
Clerical Employees	45.7%
Skilled Employees	27.6%
Unskilled Employees	27.6%

Vocational-Technical Training:

Professional Employees	1.9%
Managerial Employees	2.9%
Salespeople	2.9%
Clerical Employees	2.9%
Skilled Employees	13.3%
Unskilled Employees	1.0%

Specialized Training:

Professional Employees	5.7%
Managerial Employees	15.2%
Salespeople	5.7%
Clerical Employees	9.5%
Skilled Employees	18.1%
Unskilled Employees	1.0%

Two-Year College Degree:

Professional Employees	1.9%
Managerial Employees	8.6%
Salespeople	4.8%
Clerical Employees	2.9%
Skilled Employees	0.0%
Unskilled Employess	0.0%

Four-Year College Degree:

Professional Employees	30.5%
Managerial Employees	18.1%
Salespeople	7.6%
Clerical Employees	1.0%
Skilled Employees	0.0%
Unskilled Employees	0.0%

No Educational Requirement:

Professional Employees	3.8%
Managerial Employees	6.7%
Salespeople	9.5%
Clerical Employees	10.5%
Skilled Employees	13.3%
Unskilled Employess	27.6%

Future Training Needs

The participants in the survey were asked if they anticipated needing workers who are either better of differently trained than current workers in the next two to three years. Seventy businessess (66.7 percent) responded negatively to this question. However, 31 businessess (29.5

percent) said that their human resource needs would change in the future.

The businessess which answered "yes" to this question were then asked to briefly describe the additional training needs anticipated. The responses to this question are summarized below:

Sales
Four-Year Degree
Computer Training
Irrigation Knowledge
Plant Knowledge (Botany)
Health Care Skills
Welding
Painting
Electrical Skills
Clerical Skills
Management Skills
Skilled Labor
Data Entry
Word Processing
Mechanical Ability
Knowledge of Chemicals
Steel Erection
Computer-Aided Drafting
Robotics
Specialized Crafts
Quality Control (SPC)
Jewelry-making
Automotive Electronics
Office Management
Electro-mechanical skills
Solid-State Electronics
Machine Operations
Automotive Mechanics

Those specific skills which were mentioned most frequently by respondents included: 1) sales, 2) computer-related skills, 3) welding, 4) management skills, 5) computer-aided drafting, 6) word processing, and 7) electronics.

In addition to specific job skills which will be in demand by employers in the future, several businessess also mentioned general skills which they feel are currently lacking in workers they employ. These skills include more overall education, good work ethic and attitude, good communicator (both written and oral), and human relations skills.

Provisions Made For Continuing Training/Education

The respondents were asked to identify the provisions which their companies make for employees pursuing training or development. The respondents were able to check all answers which applied. Only sixteen companies provide leave time, while 89 companies do not. Thirty-five companies (33.3 percent) provide tuition reimbursement, while 70 companies (66.7 percent) do not. Twelve companies report making other unspecified provisions. Forty-four companies (41.9 percent) report giving their employees no provisions for training and development.

Other Comments From the Respondents

The participants in the survey were asked to make any comments concerning training of employees which had not been addressed by the questions in the survey. Usually, those responding to this type of question feel very strongly about the issue they express in their comment. The answers to this open-ended question are summarized below:

Surplus of trained employees in the area
Prefer to hire high school students and train them myself
Need good proof-readers
Need employees with a good work ethic
Welcome workshops to aid in on-the-job training
Need workers with people relation skills
Need more workers with management skills
Need workers who are motivated to work
Need workers who have computer training

Secondary Information Concerning the Local Job Market

In addition to the primary data collected in the survey, secondary information concerning the job market in the area was also collected. This secondary information gives a stronger indication of specific job skills which will be demanded by all employers in the North Texas Area.

The Texas Employment Commission Office in Denton was contacted concerning jobs which are in demand in this area. The job skills which are needed are summarized as follows:

Clerical Skills
Computer Operators
Data Processing
Fast Food Workers
Secretarial Skills (Typing 60wpm, Shorthand 80wpm)
Retail Clerks
Transportation and Public Utilities Occupations

Published sources were also consulted. One source was the AREA JOB OUTLOOK 1990. In this book, Denton County is included in the Dallas PMSA, while Cooke and Montaque Counties are included in the Sherman-Denison MSA. The jobs which are projected to be in demand by this source in these two metropolitan statistical areas are reproduced in Appendix C.

A second published source consulted was OCCUPATIONAL EMPLOYMENT: TEXAS METROPOLITAN STATISTICAL AREAS ANNUAL AVERAGE 1985 prepared by the Texas Employment Commission Economic Research and Analysis Department. The breakdown of the counties is the same as was presented in AREA JOB OUTLOOK 1990. The reproduction of this list is included in Appendix D.

The third source consulted was the JOB HUNTER'S GUIDE FOR NORTH CENTRAL TEXAS prepared by the Training Employment Development Division of the Texas Department of Community Affairs. In this booklet, Denton County is included in Region 1, Montague County is included in Region 3, and Cooke County is included in Region 4. The reproduction of the lists of jobs skills in demand in these three regions is presented in Appendix E. In addition, the general projections of the future of the job market in each of these regions is also presented.

The final source consulted was a supplement in the June 28, 1987 edition of THE DALLAS TIMES HERALD. This supplement was entitled COLLEGE MAGAZINE. One section of this supplement presented job opportunities and salaries which will be in demand in North Texas. These job skills are obtained from vocational programs and are presented in Appendix F.

V18 OUTSIDE SOURCES

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
NOT REPORTED	0	3	2.9	2.9	2.9
YES	1	22	21.0	21.0	23.8
NO	2	80	76.2	76.2	100.0
TOTAL		105	100.0	100.0	

Mean 1.733 Std Dev .505 Minimum 0.0
Maximum 2.000

Valid Cases 105 Missing Cases 0

V19 FUTURE TRAINING

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
NOT REPORTED	0	23	21.9	21.9	21.9
YES	1	36	34.3	34.3	56.2
NO	2	45	42.9	42.9	99.0
TOTAL		104	100.0	100.0	

Mean 1.229 Std Dev .800 Minimum 0.0
Maximum 2.000

Valid Cases 105 Missing Cases 0

V20 PLACE PREFERENCE

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
NOT REPORTED	0	57	54.3	54.3	54.3
ON-SITE	1	30	28.6	28.6	82.9
OTHER	2	6	5.7	5.7	88.6
COLLEGE CAMPUS	3	12	11.4	11.4	100.0
TOTAL		105	100.0	100.0	

Mean .743 Std Dev 1.000 Minimum 0.0
Maximum 3.000

Valid Cases 105 Missing Cases 0

V21 LEAVE TIME

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
NOT AVAILABLE	0	89	84.8	84.8	84.8
AVAILABLE	1	16	15.2	15.2	100.0
TOTAL		105	100.0	100.0	

Mean .152 Std Dev .361 Minimum 0.0
Maximum 1.000

Valid Cases 105 Missing Cases 0

V22

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
NOT AVAILABLE	0	70	66.7	66.7	66.7
AVAILABLE	1	35	33.3	33.3	100.0
TOTAL		105	100.0	100.0	

Mean .333 Std Dev .474 Minimum 0.0
Maximum 1.000

Valid Cases 105 Missing Cases 0

V23 OTHER

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
NOT AVAILABLE	0	93	88.6	88.6	88.6
AVAILABLE	1	12	11.4	11.4	100.0
TOTAL		105	100.0	100.0	

Mean .114 Std Dev .320 Minimum 0.0
Maximum 1.000

Valid Cases 105 Missing Cases 0

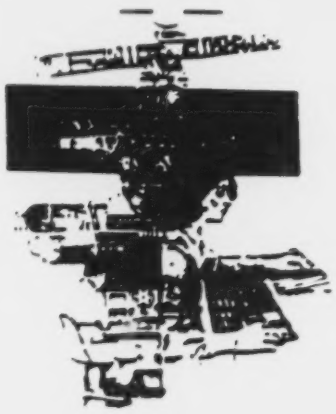
V24 NO PROVISIONS

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
NOT AVAILABLE	0	61	58.1	58.1	58.1
AVAILABLE	1	44	41.9	41.9	100.0
TOTAL		105	100.0	100.0	

Mean .419 Std Dev .496 Minimum 0.0

STUDENT SURVEY

A survey to determine potential interest in an electronics training program was presented to the public in area newspapers on April 26, 27, and 28, 1989. Within one week, 48 individuals responded positively to the survey. Numerous inquiries via telephone and personal contact have come from individuals and public school personnel. It is anticipated that a minimum of 24 full-time students will enroll for the Fall Semester. Inquiries from local industries point to heavy demand for part-time evening students. Andrews Corporation of Denton has asked for eight slots for their personnel if they can be accommodated during evening hours.



Interested in preparing for a career offering excellent opportunities in an exciting professional field, with growth potential extending into the next century?

Cooke County College is developing 2-year, Associate of Applied Science Degree programs to train

ELECTRONICS ENGINEERING TECHNICIANS & ELECTRONICS TECHNICIANS

to begin admitting students in the 1989 Fall Semester*.

Selected courses in the two degree plans will be offered to Gainesville High School students, with credit transferable to Cooke County College under an articulation agreement**.

Please help us measure potential student interest in the programs by supplying the information asked for below and returning it by Wednesday, May 3, 1989, to: **Whitten G. Williams, Dean of Administrative Services, Cooke County College, 1525 W. California, Gainesville, TX 76240.** Thank you for your interest and assistance. We will keep those who respond informed of the status of the program and how they can get enrolled.

* Pending formal approval by the Texas Higher Education Coordinating Board
* Pending formal approval by the Texas Education Agency

Electronics Technicians are specially trained paraprofessionals prepared to work in a broad range of electronics-related career fields including manufacturing, installation, maintenance & repair, servicing, technical sales, technical writing, and research & development.

Yes, I'm interested in Cooke County College's proposed Associate Degree programs in electronics. My primary interest is in:

- ☐ Electronics Engineering Technology
- ☐ Electronics Technology
- ☐ I am enrolled at Gainesville High School.
- ☐ I am enrolled at another high school (please name):_____
- ☐ I am an adult not enrolled at any high school.
- ☐ Please send me additional information about the programs, including information on admission requirements and how to enroll.

NAME _____ PHONE _____

MAILING ADDRESS _____

Cooke County College is an Equal Opportunity/Handicapped/Affirmative Action employer and service provider.

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GAINESVILLE ISD/COOKE COUNTY COLLEGE
ELECTRONICS 2 + 2 PROGRAM
STUDENT ASSESSMENT

FINAL REPORT

SUBMITTED BY

DR. JERRY W. MOORMAN
UNIVERSITY OF NORTH TEXAS

MAY 8, 1989

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A - TEXTBOOK READABILITY

B - MESA PROFILE

C - SAMPLE ASSESSMENT TRACKING FORM

per Tom Lottin 10/8/90

INTRODUCTION

The basic philosophy of any well-designed assessment process should be one of screening students into a program as opposed to screening them out. Assessment as a process is designed to insure that the right students are matched with the right programs. If assessment is accurate, then those students going into any given subject will have demonstrated the skills, aptitudes, and interests requisite for success in that subject.

This report will serve as the author's recommendation for such an assessment process in the area of electronics. Electronics is a highly technical discipline that requires potential students to demonstrate mastery of certain cognitive skills; to possess certain aptitudes, interests, and attitudes; and to demonstrate certain levels of skills in the sensory/motor area. If prospective students meet the assessment standards, their chances for success in the area are greatly enhanced. If they do not, then obviously their potential for failure is great.

The assessment system recommended in this document is, thus, an attempt to prevent student failure. Adherence to its suggestions will provide students for the new electronics program that have demonstrated their potential for success. Although success can never be guaranteed, this process will most certainly increase the probability.

READING ASSESSMENT

The first step in the assessment process was to establish a reading level that must be demonstrated by the students wishing to enroll in the Electronics Program. The reading level was established by conducting a readability measure on each of the textbooks that have been identified for use in the program.

Each text was examined in a minimum of eight places to determine its average level of readability. In addition, the range of readability was also plotted. A computerized form of the Bormuth Readability Index was used for this process. The results for all texts are included in Appendix A.

As a result of the readability examination, the following standard is recommended as the minimum reading level that a student should demonstrate upon initial entrance into the program:

READING LEVEL - 7TH GRADE

This standard is recommended for both secondary and post-secondary students, since textbooks for all students will be identical.

It is further recommended that the TEAMS Test be used at Gainesville High School to demonstrate this standard; and that the Nelson-Denny be used at Cooke County College.

MATH ASSESSMENT

Being a highly technical area, Electronics requires that potential students enter the program with a certain level of math. The math standards listed below are a result of the math courses required in the Electronics Program.

HIGH SCHOOL MATH LEVEL - SUCCESSFUL COMPLETION OF THE PRE-ALGEBRA COURSE

COLLEGE MATH LEVEL - ELIGIBLE TO ENTER CP 1043, DEVELOPMENT ALGEBRA

It is further recommended that the math level at the secondary level be determined by transcript evaluation and at the post-secondary level by the Math Placement Test.

SENSORY/MOTOR ASSESSMENT

Because of the nature of the discipline, Electronics requires a level of certain psychomotor skill that may not be common to other areas of study. If the student is to find success in the program, these levels of skill mastery must be present. The following psychomotor standards are recommended as the minimum levels students should demonstrate upon entrance into the program. Levels are taken from the Labor Department's Handbook for Analyzing Jobs published in 1972.

MOTOR COORDINATION	LEVEL 3	Defined as the ability to make movement quickly and accurately.
FINGER DEXTERITY	LEVEL 3	Defined as the ability to manipulate sma objects rapidly and accurately.
MANUAL DEXTERITY	LEVEL 4	Defined as the ability to move hands eas and skillfully.
EYE-HAND-FOOT COORDINATION	LEVEL 5	Defined as the ability to use hands and fe together in a skillful manner.
COLOR DISCRIMINATION	LEVEL 4	Defined as the ability to match or discriminat between colors by sight or from memory.

It is recommended that these standards be the same for both secondary and post-secondary students since psychomotor requirements will be identical for both programs.

It is further recommended that a criterion referenced test be used for measuring this standa The author recommends the use of the MESA or some newer generation of same. MESA is a acronym for Microcomputer Evaluation and Screening Assessment. It is a commercially availa instrument from Valpar International Corporation located in Tucson, Arizona. A MESA Profile of Electronics program is included in Appendix B for use with the system.

If it is not possible to secure an assessment instrument such as MESA, then an accepta substitute would be the norm-referenced system known as GATB [General Aptitude Test Battery]. has been administered in the past by Gainesville High School and could probably be done again. M Mike Martin at the high school is licensed to administer the GATB. If the GATB is used, a decision have to be made concerning a cut-off percentile required for students entering the program.

Regardless of the instrument chosen, it should be made available to both secondary and p secondary students. Each will need to demonstrate mastery of the required psychomotor standar

APTITUDE AND INTEREST ASSESSMENT

It is recommended that each potential secondary and post-secondary student be assessed general aptitudes and interests prior to being admitted to the program. No standard is suggested

APTITUDE AND INTEREST ASSESSMENT

It is recommended that each potential secondary and post-secondary student be assessed for general aptitudes and interests prior to being admitted to the program. No standard is suggested in this area, although it is highly recommended that each prospective student show a general aptitude for and interest in activities of a scientific and technical area.

It is further recommended that the CAPS [Career Ability Placement Survey] and COPS [Copsystem Interest Inventory] be used for this component of the assessment. Both are currently available and in use at Gainesville High School and Cooke County College.

INTERVIEW

The final component of student assessment that is recommended is individual student interviews conducted by the ELectronics teachers. These are necessary so that an assessment may be made of each individual student's attitude toward the program. Information of an affective nature is just as important to the overall selection process as the cognitive and psychomotor assessment previously recommended.

The author's recommendation is that a structured interview process be used where one list of questions is developed and asked of all potential students. A few sample questions follow for consideration.

1. What is your occupational objective?
2. How will the Electronics Program help you to achieve your occupational objective?
3. What specific part of electronics attracts you the most?
4. Do you have any past experience in electronics? [employment or recreation/hobby].
5. What do you think the average electronics class will be like?
6. Do you like math and science type courses? Why?
7. What kinds of tools and equipment have you used in the past?
8. Do you like to try and solve problems?
9. What do you like to do in your spare time?
10. Assume that 11 students want to enroll in the Electronics Program and that we can only take 10. Convince me that you should be one of the 10 admitted.

In addition to a list of interview questions, the teachers should also have the results of all previous assessment steps that have been completed.

ASSESSMENT PROCEDURE

The assessment procedure for entrance into the Electronics 2 + 2 Program should take place as follows:

Step 1 - Student declares an interest. [All students go to next step.]

Step 2 - The student's transcript is evaluated to insure that the math requirement has been met. [Students meeting requirement go to next step.]

Step 3 - The student's record is evaluated to insure that the 7th grade reading level requirement has been met. [Students meeting requirement go to next step.]

Step 4 - Aptitude and Interest Tests are administered. [Students not exhibiting appropriate aptitude or interest should receive counseling before going to the next step. All others go immediately to next step.]

Step 5 - MESA or GATB Test is administered. [Students who meet set standard go to next step.]

Step 6 - Each potential student is interviewed. [All students go to next step.]

Step 7 - Program selection decision is made. [Students meeting assessment standards are admitted to the Electronics Program.]

Note: Some sort of tracking form should be used to keep track of students as they progress through the various assessment steps. An example form is included in Appendix C.

CONCLUSION

Assessment as a means of selecting the right student for the right program is not always an easy task. By its very nature, assessment adds an extra time component to the process of placing students into programs. Because of the extra time required, it is often a much debated issue. Time is not the issue, however; the issue is helping a student make a wise career choice. If that factor is remembered, then the time factor becomes an issue of little consequence.

What is being proposed here is a reasonably simple system for assessing the suitability of students for success in the ELectronics Program. Although it will add a measure of time to the scheduling process, adherence to its various facets will most certainly aid students in appropriate career choices.

APPENDICES

APPENDIX A

TEXTBOOK READABILITY

GAINESVILLE ISD COOKE COUNTY COLLEGE

ELECTRONIC TEXTS' READABILITY

	AVERAGE	RANGE
TECHNICAL MATH I	6.5	4.7-8.2
TECHNICAL MATH II	5.2	2.6-8.8
INTRODUCTORY ELECTRONIC DEVICES AND CIRCUITS	5.3	3.4-6.2
INTRODUCTORY DC/AC ELECTRONICS	7.2	2.1-10.
ELECTRONIC CIRCUITS	6.8	4.6-10.
DC ELECTRONICS	7.3	6.5-8.2
AC ELECTRONICS	7.2	4.8-10.

B

MESA PROFILE

Valpar Comprehensive Access Profile

SCHOOL ACCESS PROFILE INFORMATION

Electronics
E NAME

THENT _____ CREDITS

E DESCRIPTION Gainesville H.S.
Cooke County C.C.

18/89
INSTRUCTOR

JOB/EMPLOYER ACCESS PROFILE INFORMATION

TLE

PTION

Y NAME

S

STATE ZIP CODE ( ) PHONE NUMBER

CONTACT PERSON

e Valpar Comprehensive Access Profile is an integral part of the Valpar Micro-
r Evaluation and Screening Assessment (MESA) System. The Profile is used
are the results of the assessment to criteria established for success in a
urse of study, or training program.

effect, when you complete the Access Profile, you have recorded both the
cant factors, and the level at which a person must possess those factors,
elate directly to success in your specific situation.

general, the Access Profile Program fits into the vocational evaluation
as follows:
The Micro-Computer Evaluation and Screening Assessment (MESA) gathers
information on over sixty (60) factors related to work/jobs.

The Dictionary of Occupational Titles analyzes and rates over twenty
(20) factors directly related to work/jobs. These factors combine
to make the Worker Qualifications Profile for specific jobs.

The results of the MESA are analyzed and related directly to the Worker
Qualifications Profile for specific jobs.

The Valpar Comprehensive Access Profile analyzes the factors directly related
to your specific situation and relates them to the factors on the D.O.T.
Worker Qualifications Profile.

You can now compare the assessment results of any person interested in your situation with the criteria you have established. The person will match all of the criteria, some of the criteria, or none of the criteria. The evaluator can use this information to assist the individual in making valid decisions regarding vocational and/or educational choices. In this respect, you are now part of the vocational evaluation team. Your input regarding your specific situation becomes the final element in the evaluation process.

Completing the Access Profile is not difficult. First review the twenty-three (23) major areas and decide which level for each area is applicable to your situation. Circle that level. Your response is entered into the computer and an Access Profile summary report can then be printed using your unique, specialized criteria.

DATA: The ability to use information, ideas, symbols, and concepts.
Circle the number of the phrase which best describes the level at which the person must function in your situation.

LEVEL	
0	Synthesizing - analyzing data to discover new facts or develop new concepts (creating, designing, conducting research).
1	Coordinating - using data to determine actions or sequences of action to be taken (planning, directing, organizing).
2	Analyzing - examining data to discover alternatives (examine, review, study).
3	Compiling - gathering, arranging, or classifying data (interview, catalog, collect).
(4)	Computing - performing arithmetic operations (calculate, quote).
5	Copying - transcribe data from one place to another (enter, record, type).
6	Comparing - judge observable characteristics of things (sort, inspect, select).

PEOPLE: The ability to interact with people.
Circle the number of the phrase which best describes the level at which the person must function in your situation.

LEVEL	
0	Mentoring - dealing with individuals at the deepest level (counsel, advise, guide)
1	Negotiating - exchanging ideas to create policy or solve problems (arrange, confer, negotiate).
2	Instructing - transmit knowledge and/or skills to others (teach, train, coach).
3	Supervising - controlling or coordinating the activities of others (assign, direct, evaluate).
4	Diverting - amusing others (perform, act, sing).
(5)	Persuading - influencing the behavior or ideas of others (sell, solicit, promote).
6	Speaking/Signaling - exchanging information by voice or signal (interview, inform, explain).
7	Serving - attending to the immediate needs of others (feed, accompany, deliver).
8	Taking Instructions/Helping - following directions from others (help, assist, respond).

MESA

Circle the number of the [illegible] which best describes the level at which the person must function in your situation.

LEVEL	
0	Setting Up - Installing or repairing machine (repair, adjust)
1	Precision Working - skillful use of hands or tools to produce work meeting specific standards (layout, polish, diagram)
2	Operating/Controlling - directing the functions of machines and equipment (attach, position, regulate)
3	Driving/Operating - continuous control of a machine which must be guided (steer, pilot, drive).
4	Manipulating - to move, guide, or place materials (trim, scrape, mix)
5	Tending - starting, stopping, or observing machines (turn valves, adjust blowers).
6	Feeding/Offbearing - placing or removing materials from automatic machines (pick up, hang, dump)
(7)	Handling - move or carry objects or materials (lift, scrub, carry)

GUIDE TO OCCUPATIONAL EXPLORATION (GOE) Circle one vocational interest cluster which best represents your specific situation.

01	Artistic
02	Scientific
03	Plants & Animals
04	Protective
05	Mechanical
(06)	Industrial (Production)
07	Industrial (Support)
08	Selling
09	Accommodating
10	Humanitarian
11	Leading/Influence
12	Sports

PHYSICAL DEMANDS. Circle the physical capacities required of the individuals in order for them to perform in your situation. Circle a YES or NO for each item.

1)	(YES)	NO	Sedentary - lifting 10 pounds maximum and occasionally lifting and/or carrying lighter objects.
	(YES)	NO	Light Work - lifting and/or carrying 10 pounds maximum
	(YES)	NO	Medium Work - lifting and/or carrying 25 pounds maximum
	YES	(NO)	Heavy Work - lifting and/or carrying 50 pounds maximum
	YES	(NO)	Very Heavy Work - lifting and/or carrying 50 pounds or more.
2)	YES	(NO)	Climbing - ascending or descending ladders, scaffolding, etc.
	YES	(NO)	Balancing - maintaining body equilibrium on slippery or erratically moving surfaces.
3)	YES	(NO)	Stooping, Kneeling, Crouching, and/or Crawling
4)	(YES)	NO	Reaching, Handling, Fingering, and/or Feeling
5)	YES	NO	Talking
	YES	NO	Hearing

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SPECIFIC VOCATIONAL PREPARATION (SVP) Circle the vocational training time required to master entry-level skills for your situation. Circle ONE ONLY.

9	over 10 years
8	4 to 10 years
(7)	2 to 4 years
6	1 to 2 years
5	6 months to 1 year
4	3 months to 6 months
3	30 days to 3 months
2	Beyond short demonstration and up to 30 days
1	Short demonstration only

APTITUDES Rate the level required of a person in your situation. Circle one level (from 1 to 4 or 1 to 5, with 1 being the highest level) for each of the aptitudes in this section. Rate the situation only on the required level of the specific aptitude for each section.

G - INTELLIGENCE General learning ability required.

LEVEL	
1	Conduct research, diagnose diseases, write plays, or perform engineering design.
2	Perform accounting, manage a business, perform scientific lab tests, or repair electronic equipment.
(3)	Perform secretarial tasks, nurse sick individuals, operate telephone switchboard, or assemble electronic equipment
4	Operate sewing machine, perform mechanical assembly, drive forklift, or sort laundry.

V - VERBAL: The ability to use and understand language

LEVEL	
1	Read complex technical material, write complex editorials, present legal arguments, or review literary materials.
2	Read business material, teach at secondary level or higher, interview job applicants, or understand contracts
(3)	Proofread printed copy, type letters and reports, perform on-the-job training, or conduct tours.
4	Perform retail sales, read recipes, understand oral or written assembly instructions.
5	No verbal aptitude required

N - NUMERICAL The ability to perform math quickly and accurately

LEVEL	
1	Use Algebra, calculus, analytical geometry, or specialized engineering math formulas.
2	Perform business math, do accounting, perform architectural design, or solve standard formulas.
(3)	Compute costs of materials, measure parts using micrometers, etc., perform ship math, or measure chemicals.
4	Perform simple measurements, use recipes, post business figures, or count and record items.
5	No numerical aptitude required

S - SPATIAL Ability to think visually about geometric forms and to use diagrams.

LEVEL	
1	Read x-rays, design offices and homes, or draw illustrations for publications.
2	Read blueprints and circuit diagrams, follow sewing patterns, or plan equipment layout.
3	Operate cranes, adjust printing press alignment, install electrical wiring, or pack cargo areas.
(4)	Set up looms, inspect mechanical assemblies, press clothing, or operate forklift.

LEVEL E - EYE-HAND-FOOT COORDINATION: Ability to use hands and feet together in a skillful manner.

1 Performing gymnastics, piloting aircraft, or teaching sports.

2 Operate cranes, perform steel work above ground, or climb and adjust antenna towers.

3 Ride horseback, drive motor vehicles, serve food, or service light towers.

4 Operate pressing machine, use foot-operated trimming machine, or teach golf.

(5) Eye-hand-foot coordination not required.

LEVEL C - COLOR DISCRIMINATION: Ability to match or discriminate between colors by sight or from memory.

1 Perform commercial art, apply stage make up, perform surgery, or reweave expensive oriental rugs.

2 Mix house paint to color, perform interior design, color women's hair, or perform taxidermy.

3 Grade and sort leather, sort produce, select fabric for upholstery repair, or sell yard goods.

(4) Sort fish, create designs in colored tile, or perform meat cutting.

5 Color discrimination not required.

INTERESTS: Circle up to three (3) interest factors which best describe the interests a person should have to be successful in your situation.

The interest factors are as follows:

1a. A preference for activities dealing with things and objects. vs. 1b. A preference for activities concerned with the communication of data.

2a. A preference for activities involving business contact with people. vs. (2b) A preference for activities of a scientific and technical nature.

3a. A preference for activities of a routine, concrete, organized nature. vs. 3b. A preference for activities of an abstract and creative nature.

4a. A preference for working for the presumed good of people. vs. (4b) A preference for activities that are carried on in relation to processes, machines, and techniques.

5a. A preference for activities resulting in prestige or the esteem of others. vs. (5b) A preference for activities resulting in tangible, productive satisfaction.

Rank the interest/s circled by writing your choice/s in the appropriate space.

2B 1st priority

4B 2nd priority (optional)

5B 3rd priority (optional)

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TEMPERAMENTS: Circle those temperaments which must be present for a person to succeed in the position in question. Choose all that apply in a significant way.

D Responsible for the direction, control, or planning of an activity. Necessary to engineers, managers, teachers, advisors, and skilled technicians.

F Interpreting feelings or ideas for others. Necessary to actors, artists, critics, musicians, etc.

I The ability to convince, redirect, or influence others. Necessary to sales, negotiating, teaching, etc.

J Ability to make decisions based on personal judgement. Necessary to cooking, police work, lighting design, etc.

(M) Ability to make decisions based on verifiable criteria. Necessary to science, medicine, business management, etc.

(P) Ability to deal effectively with people. Necessary to interviewing, sales, personnel management, etc.

(R) Ability to perform repetitive work on a continuous basis. Necessary to clerical work, production assembly, machine tending, etc.

S Ability to perform well in stressful situations. Necessary to surgical medicine, law enforcement, air traffic control, etc.

(T) Ability to produce work to precise tolerances or standards. Necessary in pharmacy, navigation, quality control, testing, etc.

V Ability to perform a wide variety of different types of tasks without the variety itself causing a loss of efficiency. Necessary in secretarial work, teaching, sales, mechanical repair, etc.

INSTRUCTION FOLLOWING: Circle the level at which a person must function to be successful in your situation.

LEVEL

1 Can initiate the thought or study required to follow through with an assigned task or series or tasks.

2 Can follow both written and verbal instructions that require individual thought and/or study to complete the task or a series of tasks.

(3) Can follow both written or verbal instructions that are precise and only address one or two tasks at a time.

4 Can follow brief, one or two-step instructions given verbally for a sustained period of time; a day or when the task is finished.

5 Instruction following is not required.

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MESA

WORK CONDITIONS Circle the description of the environmental conditions for which the individual must adjust in your situation YES or NO for each item.

1) (YES) NO Inside - a major portion of the work is done inside.
   YES (NO) Outside - a major portion of the work is done outside.
   YES (NO) Both - the individual must work both inside and outside.
2) YES (NO) Extreme Cold - extremes with or without temperature changes.
3) YES (NO) Extreme Heat - extremes with or without temperature changes.
4) YES (NO) Wet and/or Humid - sufficiently high to cause marked body discomfort.
5) (YES) NO Noise and/or Vibrations - cause marked distraction, possible hearing loss, and/or a strain on the body
6) (YES) NO Hazards - situations in which there is danger to life, health, or bodily harm.
7) (YES) NO Atmospheric Conditions - affects respiration or the skin (fumes, odors, dust, mist, gas, poor ventilation, etc.).

GED Rate the level required of a person to the position under consideration. Circle only one level for each area.

LEVEL	Reasoning Development Required
6	Apply logical or scientific thought to deal with a variety of abstract concepts (design, arbitrate, interpret).
5	Apply logical or scientific thought to collect data or understand technical instructions (diagnose, evaluate, train).
(4)	Apply vocational or business principles to solve practical problems (plan, inspect, record).
3	Apply common sense to problems in standardized situations and follow written or diagramatic instructions (operate, prepare, adjust).
2	Apply common sense to deal with concrete problems and follow detailed but uninvolved instructions (deliver, guard, assist).
1	Apply common sense to carry out simple one or two-step instructions (sort, tend, pack).

LEVEL	Math Development Required
6	Advanced calculus, complex statistics.
5	Algebra (quadratics), analytical geometry, simple statistics.
(4)	Basic algebra, plane geometry, and shop math
3	Calculate variables and use formulas to determine area or volume
2	Add, subtract, multiply, and divide; calculate money
1	Add and subtract two-digit numbers; know basic units of measurement; make change under one dollar.

LEVEL	Language Development Required
6	Edit, teach, conduct research
5	Read literature and scientific or legal documents, write novels, manuals, or songs; speak effectively in public
4	Read novels, newspapers; write business letters, reports, discuss and debate
(3)	Read novels, magazines, shop instructions; write essays with proper spelling, punctuation; speak to groups using correct English
2	Read adventure stories and comic books; write full sentences in cursive style, speak correct English.
	[illegible] and speak simple sentences.

LEVEL	F - FORM PERCEPTION Ability to perceive detail in objects and make visual comparisons.
1	Perceive grain structure within crystal; or compare microscopic samples using microscope.
2	Compare production items to blueprints, perform commercial photography, or read and write shorthand.
3	Grade vegetable products, inspect watches and clocks, or perform meat cutting.
(4)	Buff or polish production parts, pack produce, inspect furniture, or perform welding.
5	No form perception required.

LEVEL	O - CLERICAL PERCEPTION Ability to quickly and accurately perceive words and numbers.
1	Proofread printed material, perform complex scientific calculations, or create flow charts from tabular data
2	Type letters and reports, post accounting data, or compute payrolls.
3	Operate switchboard, read blueprints, operate cash register, or cook from recipes.
(4)	Read measuring instruments, gauges, and meters, or sort mail
5	No clerical perception required

LEVEL	K - MOTOR COORDINATION Ability to make coordinated movements quickly and accurately.
1	No illustration
2	"Touch" typing, operate cash register, sketching and drawing, or hair cutting and styling.
(3)	Perform mechanical assembly, operate forklift, sort agricultural products, or plaster walls.
4	Perform garment pressing, do hand sewing, pick produce, or sweep and mop floors.
5	Motor coordination not required.

LEVEL	F - FINGER DEXTERITY: Ability to manipulate small objects rapidly and accurately
1	Play musical instrument professionally or perform surgery
2	Repair watches, perform sleight of hand, perform engraving, or assemble electronic prototypes.
(3)	Perform architectural drawing, cut hair, take shorthand, or perform electrical wiring.
4	Assemble bakery goods, stock shelves, perform hand sewing, or operate machine control panels.
5	Finger dexterity not required.

LEVEL	M - MANUAL DEXTERITY Ability to move hands easily and skillfully
1	No illustration.
2	Professional juggling, professional violinist, performing instrument calibration, or production line soldering
3	Distributing mail, threading and operating sewing machine, or cutting hair
(4)	Picking produce, repairing furniture, performing plumbing, or electrical repairs
5	Manual dexterity not required

APPENDIX C

SAMPLE ASSESSMENT TRACKING FORM

ELECTRONICS 2 + 2 PROGRAM

Assessment Tracking Form

Student Name:_____ Date_____

Student I.D. Number:_____ School_____

___Accepted

___Not Accepted

	Completion Date	Met Standard Yes	Met Standard No	Comments
MATH				
READING				
APTITUDE & INTEREST				
SENSORY/MOTOR				
INTERVIEW				

GAINESVILLE HIGH SCHOOL
IMPLEMENTATION, TRACKING AND FOLLOW-UP

Courses avaliable to sophomores:

Technical Algebra.....1 credit

Courses available to juniors and seniors:

Technical Algebra.....1 credit
Technical Trigonometry.....1 credit
DC Circuit Analysis.....1/2 credit
AC Circuit Analysis.....1/2 credit
Digital Electronics.....1 credit

GAINESVILLE HIGH SCHOOL

COURSE DESCRIPTIONS

DC CIRCUIT ANALYSIS 1/2 Credit

Grade Placement: 11-12
(Fall Semester)
Prerequisite: Algebra I or Concurrent enrollment in Algebra I or Technical Algebra.
Class Time: 55 minutes.

A competency based broad general view of electricity and electronics. Heads into the understanding of direct current methods in series, parallel and series-parallel circuits. Other topics will include Ohm's Law, power, resistors, and an introduction into electronic measuring equipment. This is a pre-employment lab course designed to teach job related skills.

AC CIRCUIT ANALYSIS 1/2 Credit

Grade Placement: 11-12
(Spring Semester)
Prerequisite: DC Circuit Analysis, Algebra I or concurrent enrollment in Algebra I or Technical Algebra.
Class Time: 55 minutes.

A competency based course which is a continuation of DC Circuit Analysis. This course offers an understanding of alternating current, sine wave characteristics, capacitors, inductors, transformers, and their interrelationships. Electronic test equipment is also utilized in this pre-employment lab course designed to teach job related skills.

DIGITAL ELECTRONICS 1/2 or 1 Credit

Grade Placement: 11-12
Prerequisite: None
Class Time: 55 minutes.

A competency based course to include the following general topics of discussion for understanding: introduction to digital circuits, digital logic functions, memory and register circuits, counting circuits, and data circuits. Electronic test equipment is utilized in this pre-employment lab course designed to teach job related skills.

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GAINESVILLE HIGH SCHOOL

Selected List of Competencies and Rating Scales
For 2 + 2 Electronics Technology Project

The following list of terminal competencies represent appropriate elements of knowledge and skills applicable to the Electronic Technology.

The suggested rating scale is as follows:

4 Skilled - can function independently with no supervision
3 Moderately skilled - limited supervision required
2 Limited Skill - Requires close supervision
1 Exposure only - Close supervision and training
0 No exposure - No information and complete training required

GAINESVILLE HIGH SCHOOL

A. Terminal competencies for DC Circuit Analysis

4	3	2	1	0		
[ ]	[ ]	[ ]	[ ]	[ ]	2	Describe the six methods of producing an E.M.F. (friction, chemi calactivity, pressure, heat, magnetism, and light)
[ ]	[ ]	[ ]	[ ]	[ ]	3	Define volt, ampere, ohm and watt
[ ]	[ ]	[ ]	[ ]	[ ]	4	Identify insulators and conductors
[ ]	[ ]	[ ]	[ ]	[ ]	5	Read meter scales and interpolate meter readings
[ ]	[ ]	[ ]	[ ]	[ ]	6	Identify the ohmic value of resistors using the resistor color code
[ ]	[ ]	[ ]	[ ]	[ ]	7	Identify basic electronic symbols
[ ]	[ ]	[ ]	[ ]	[ ]	8	Use Ohm's Law to solve problems
[ ]	[ ]	[ ]	[ ]	[ ]	9	Define direct current (DC)
[ ]	[ ]	[ ]	[ ]	[ ]	11	Define and explain capacitance and inductance
[ ]	[ ]	[ ]	[ ]	[ ]	13	Draw series DC circuits and solve for unknown values using Ohm's Law and Kirchhoff's Law
[ ]	[ ]	[ ]	[ ]	[ ]	14	Draw parallel DC circuits and solve for unknowns using basic laws and circuits rules
[ ]	[ ]	[ ]	[ ]	[ ]	15	Draw series parallel DC circuits and solve for unknowns using basic laws and circuit rules.
[ ]	[ ]	[ ]	[ ]	[ ]	16	Measure volts with a voltmeter
[ ]	[ ]	[ ]	[ ]	[ ]	17	Use an ohmmeter to determine if the resistors are within toler ance according to color code
[ ]	[ ]	[ ]	[ ]	[ ]	18	Measure current with an ammeter
[ ]	[ ]	[ ]	[ ]	[ ]	19	Identify short circuits
[ ]	[ ]	[ ]	[ ]	[ ]	20	Identify open circuits
[ ]	[ ]	[ ]	[ ]	[ ]	21	Construct a series resistive circuit, measure voltage drops, current, resistance, and compute power.
[ ]	[ ]	[ ]	[ ]	[ ]	22	Construct a parallel circuit, measure voltage drops, current, resistance, and compute power
[ ]	[ ]	[ ]	[ ]	[ ]	23	Construct a series parallel resistive circuit and measure volt age drops, current, resistance, and compute power.
[ ]	[ ]	[ ]	[ ]	[ ]	24	Test a fuse
[ ]	[ ]	[ ]	[ ]	[ ]	25	Test a switch
[ ]	[ ]	[ ]	[ ]	[ ]	26	Test a potentiometer

B. Terminal competencies for AC Circuit Analysis

4	3	2	1	0		
[]	[]	[]	[]	[]	27	Construct and test RC and RL time constant circuits
[]	[]	[]	[]	[]	28	Define alternating current (AC) and explain its power distribution between primary and advantage over DC
[]	[]	[]	[]	[]	29	Explain terms related to frequency
[]	[]	[]	[]	[]	30	Describe inductance
[]	[]	[]	[]	[]	31	Describe inductive reactance
[]	[]	[]	[]	[]	32	Describe capacitance
[]	[]	[]	[]	[]	33	Describe capacitive reactance
[]	[]	[]	[]	[]	34	Describe how capacitive reactance and inductive reactance affects the voltage and current relationships in an AC circuit
[]	[]	[]	[]	[]	35	Describe impedance in an AC circuit
[]	[]	[]	[]	[]	36	Calculate impedance, phase angle and power factor
[]	[]	[]	[]	[]	37	Describe the basic use and operation of AC test equipment, i.e., 'O' scope, AC meters, frequency counters, and signal generators
[]	[]	[]	[]	[]	38	Calculate the turns, current, voltage, and power relationship for single phase transformers
[]	[]	[]	[]	[]	40	Measure AC volts with a voltmeter and differentiate between RMS and P-P and average voltage values

4	3	2	1	0		
[]	[]	[]	[]	[]	41	Operate a function generator
[]	[]	[]	[]	[]	42	Determine voltage and frequency with an oscilloscope
[]	[]	[]	[]	[]	44	Identify basic electronic symbols
[]	[]	[]	[]	[]	45	Locate and identify and open circuit
[]	[]	[]	[]	[]	46	Test a transformer circuit
[]	[]	[]	[]	[]	47	Construct a resonant circuit and determine resonant frequency and bandwidth
[]	[]	[]	[]	[]	48	Construct and test filter circuit
[]	[]	[]	[]	[]	49	Test and identify capacitors
[]	[]	[]	[]	[]	50	Construct series and parallel circuits. Measure voltage drops current. Calculate impedance, phase angle, and power
[]	[]	[]	[]	[]	95	Use the oscilloscope to measure waveforms
[]	[]	[]	[]	[]	115	Use analog multimeters, digital multimeters, oscilloscopes, and frequency counters to analyze the operation of analog and pulse circuits
[]	[]	[]	[]	[]	443	Calculate characteristic impedance and impedance matching of transmission lines

Terminal competencies for Digital Logic Circuits

4	3	2	1	0		
☐	☐	☐	☐	☐	120.	Explain the two types of sequential logic circuits.
☐	☐	☐	☐	☐	600.	Explain the operations of binary and BCD counters.
☐	☐	☐	☐	☐	601.	Explain the count sequence of a counter from a logic diagram.
☐	☐	☐	☐	☐	602.	Explain the operation of a shift register and discuss applications;.
☐	☐	☐	☐	☐	603.	Explain the origination of and purpose of the clock signal.
☐	☐	☐	☐	☐	121.	Explain combinational logic circuits including (but not limited to) decoders, encoders.
☐	☐	☐	☐	☐	604.	Explain the output states of a multiplexer.
☐	☐	☐	☐	☐	605.	Explain applications for multiplexer circuits.
☐	☐	☐	☐	☐	606.	Explain the output states of an XOR and XNOR circuit given the input states.
☐	☐	☐	☐	☐	607.	Explain applications of the XOR gate.
☐	☐	☐	☐	☐	608.	Explain four commonly used code conversions.
☐	☐	☐	☐	☐	609.	Explain the ROM and explain PLAs.
☐	☐	☐	☐	☐	122.	Design a combinational logic circuit for a given application.
☐	☐	☐	☐	☐	123.	Explain digital data sheets.
☐	☐	☐	☐	☐	124.	Explain and test diode logic circuits.
☐	☐	☐	☐	☐	125.	Construct and test transistor logic gates.
☐	☐	☐	☐	☐	126.	Construct and test basic TTL circuits.
☐	☐	☐	☐	☐	127.	Construct and test CMOS logic circuits.
☐	☐	☐	☐	☐	128.	Construct and test the operation of flip-flop circuits.
☐	☐	☐	☐	☐	129.	Construct and test register circuits.
☐	☐	☐	☐	☐	130.	Construct and test the operation of counter circuits.
☐	☐	☐	☐	☐	131.	Construct and test the operation of clock oscillator circuits.
☐	☐	☐	☐	☐	132.	Construct and test the operation of a decoder.
☐	☐	☐	☐	☐	133.	Construct and test 7-segment decoder driver and displays.

4	3	2	1	0		
☐	☐	☐	☐	☐	134.	Construct and test the operation of multiplexers and demultiplexers.
☐	☐	☐	☐	☐	135.	Construct and test combinational logic circuits.
☐	☐	☐	☐	☐	136.	Construct and analyze digital circuits using logic probes, oscilloscope, and other appropriate test equipment.
☐	☐	☐	☐	☐	61.	Explain the correct procedure for handling static sensitive devices.
☐	☐	☐	☐	☐	116.	Define digital logic elements, and logic levels; explain ground rules for integrated circuits; convert numbers, systems, and codes.
☐	☐	☐	☐	☐	117.	Define three basic types of logic gates, combinational logic, and sequential logic circuits. Explain truth tables, and logic equations for each of the logic functions.
☐	☐	☐	☐	☐	118.	Define and explain the characteristics of gate propagation delay, gate power dissipation, noise immunity, and fan-in/fan-out; identify types of digital IC packages and families of digital ICs.
☐	☐	☐	☐	☐	612.	Explain current source and current sink concepts of logic gates; give detailed explanations of operation and capabilities of currently used logic families.
☐	☐	☐	☐	☐	119.	Define and explain the basic types of latches and flip-flops; explain applications for latches and flip-flops; define and explain the operation of a register.
☐	☐	☐	☐	☐	174.	Discuss the logic of AND, OR, NOT, NOR, NAND, and MEMORY.
☐	☐	☐	☐	☐	347.	Must be able to explain and use DeMorgans Theorems.
☐	☐	☐	☐	☐	420.	List the correct procedures for handling static sensitive components.
☐	☐	☐	☐	☐	421.	Explain the operation of an A to D and D to A converter.
☐	☐	☐	☐	☐	422.	Understand and use binary, octal, hexidecimal and decimal numbering systems.

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ARTICULATION AGREEMENT
GAINESVILLE INDEPENDENT SCHOOL DISTRICT
AND
COOKE COUNTY COLLEGE

STATEMENT OF INTENT:

The purpose of this articulation agreement is to provide a mechanism through which vocational/technical education programs at Gainesville Independent School District (GISD) and Cooke County College (CCC) will interface, thereby granting students who have mastered agreed-upon task competencies in vocational/ technical programs at GISD to receive post-secondary credit at CCC. The programs selected for interface in this agreement are the Associate of Applied Science Degree in Electronics Engineering Technology, and the Associate of Applied Science Degree in Electronics Technology.

DEFINITIONS:

The Definitions listed are accepted as stated in this document.

ARTICULATION:

Articulation is a formal document/agreement outlining conditions under which two institutions agree to operate, and is understood to be binding on both parties and their agents for the stated time stipulated in the document.

ARTICULATED CREDIT:

Articulated credit refers to post-secondary credit awarded to an individual student for having successfully completed a specified approved course at a secondary school under the authority and guidelines of an Articulation Agreement. The credit will be held in escrow until the student meets all of the applicable stipulations of the Articulation Agreement.

ASSESSMENT TEST:

Assessment test is a criterion referenced multi-facet screening tool designed to identify desired aptitudes of prospective students wishing to enter the programs outlined in the Articulation Agreement.

COMPETENCY BASED CURRICULUM:

Competency based curriculum identifies specific bodies of knowledge and skills to be learned and the specific level of competencies for each. The delivery method is designed to teach those specific bodies of knowledge and skills. The evaluation system is designed to evaluate and measure the level of learning for each of the specified competencies using a rating scale to reflect job readiness.

COMPETENCY PROFILE:

Competency profile is a formal record outlining the specific body of knowledge and skills, and the level of competencies attained by a student without reference to norms.

CONCURRENT CREDIT:

Concurrent credit refers to post-secondary credit awarded under Cooke County College's early admission program.

ESCROW:

Escrow is the "placement in holding" of eligible credit in a secure place where the credit can be transferred to the designated post-secondary institution under the authority and stipulations of an Articulation Agreement.

POST-SECONDARY CREDIT:

Post-secondary credit is credit awarded to a student for successfully completing a specified course under the authority of a post-secondary institution and The Texas Higher Education Coordinating Board.

SECONDARY CREDIT:

Secondary credit is credit awarded to a student for successfully completing a specified course in grade level 9 through 12 under the authority of The Texas Education Agency.

SUBJECT MATTER EXPERT:

A subject matter expert is an individual who possesses the knowledge and skills associated with a defined occupational specialization.

2+2:

2+2 refers to a formal articulated curriculum existing between a secondary school and a community college or Technical Institute.

ARTICLES OF AGREEMENT:

A. ARTICLES:

1. This agreement will become effective upon approval by the President of Cooke County College (CCC), and the Superintendent of Gainesville Independent School District (GISD).GISD AND CCC agree to accept the conditions set forth in this document on an annual reoccuring basis.

2. GISD and CCC representatives including members of their respective administrative and teaching staff will meet on a semi-annual basis for the purpose of making recommendations to improve and update the conditions of this agreement. Recommendations will be formal and subject to approval by the President of CCC and the Superintendent of GISD.

3. GISD and CCC will establish an Advisory Committee consisting of members from business, industry and industrial counsels to assist in the continued development of the program.

4. Students will not be charged tuition or fee for articulated credit earned under this agreement. After successfully completing six hours and at the student's request, the transferred articulated credit will be recorded on CCC's official records.

5. Students enrolling for concurrent credit must meet all provisions of CCC's Early Admissions program, and must pay applicable tuition and fees at registration.

6. Competency Profiles will be maintained in a permanent file for credit earned under this agreement.

7. Approved courses taught by both institutions will have common syllabi, competencies, and standards.

8. Credit earned at GHS under this agreement is valid and transferable to CCC for a period of five years from the date of a students graduation from GHS.

9. All new faculty and administrators involved with this Articulation Agreement will receive in-service training on the agreement.

10. Both parties agree to make every effort possible to insure that students in the process will be provided reasonable opportunity to successfully complete the program. Petition to end this agreement must be submitted no less than one year in advance of the intended date of termination.

11. The petition must be submitted in writing and signed by the college president or the school superintendent making the petition.

12. The petition must be delivered to the second party to the agreement. Delivery of the intent to terminate will constitute formal notification and will serve as grounds for termination one year following the date of delivery.

B. COURSES ELIGIBLE FOR ARTICULATED CREDIT:

The following courses are approved as articulated program courses that may be taught at GHS and/or CCC, and will be accepted for transfer credit by CCC.

CCC Courses		GHS Courses
EL-1103	DC CIRCUIT ANALYSIS	DC CIRCUIT ANALYSIS
EL-1203	AC CIRCUIT ANALYSIS	AC CIRCUIT ANALYSIS
EL-1403	DIGITAL LOGIC CIRCUITS	DIGITAL LOGIC CIRCUITS
MA-1363	TECHNICAL ALGEBRA	*TECHNICAL ALGEBRA
MA-1373	TECHNICAL TRIGONOMETRY	*TECHNICAL TRIGONOMETRY
PH-1223	UNIFIED TECHNICAL CONCEPTS-PHYSICS	PRINCIPLES OF TECHNOLOGY-PHYSICS

C. COURSES ELIGIBLE FOR CONCURRENT CREDIT:

The following listed courses are approved as concurrent program courses that may be taught at GHS and/or CCC, and will be accepted for transfer credit by CCC.

CCC Courses		GHS Courses
EL-1103	DC CIRCUIT ANALYSIS AC CIRCUIT ANALYSIS	DC CIRCUIT ANALYSIS AC CIRCUIT ANALYSIS
EL-1403	DIGITAL LOGIC CIRCUITS	DIGITAL LOGIC CIRCUITS
GO-2443	AMERICAN STATE AND LOCAL GOVERNMENT	AMERICAN STATE AND LOCAL GOVERNMENT
MA-1363	TECHNICAL ALGEBRA	*TECHNICAL ALGEBRA
MA-1373	TECHNICAL TRIGONOMETRY	*TECHNICAL TRIGONOMETRY
MA-1113	COLLEGE ALGEBRA	COLLEGE ALGEBRA
MA-1123	TRIGONOMETRY	TRIGONOMETRY
EN-1043	GRAMMAR AND COMPOSITION	ENGLISH IV-1 HONORS
EN-1053	LITERATURE AND COMPOSITION	ENGLISH IV-2 HONORS

D. ELIGIBILITY:

Entry into the Electronics Engineering Technology and Electronics Technology Programs at CCC may be gained by the following methods:

HIGH SCHOOL STUDENTS:

1. Students enrolled in Gainesville High School.(GISD) may enroll in the programs under the following conditions:

   a. Enrolled in good standing.
   b. Enrolled in Grade level 11 or above. The courses identified with an "" may be taken in grade level 10 or above.
   c. Have successfully completed the program assessment test.
   d. Have secured the approval of the high school counselor.

COOKE COUNTY COLLEGE STUDENTS:

1. Students enrolled in CCC may enroll in the programs under the following conditions:

   a. Enrolled in good standing
   b. Have successfully completed the program assessment test.
   c. Have secured the Electronics Department counselor's approval.

GENERAL PUBLIC:

1. The general public may enroll in the programs under the following conditions:

   a. Satisfy existing entrance requirements of CCC.
   b. Have successfully completed the program assessment test.
   c. Has secured the Electronics Department counselor's approval.

E. PROCEDURES:

The conditions of articulation are hereby set forth:

1. **High school enrollment:**

   Students in grade level 7 and above will be counseled periodically in each grade leve pertaining to the articulated program and the required prerequisites.

   a. Option # 1 concurrent credit:
      Students must follow established CCC concurrent credit enrollment procedures. Students desiring to enter the Electronics Program as a concurrent credit student wil request permission to be tested through their counselor. At that time the student will b provided a list of requirements and scheduled for the required assessment test. Upo successful completion of the assessment test the student will be admitted to the degree program of their choice.
   b. Option # 2. Articulated credit:
      Students desiring to enter the program as an articulated credit student will reques permission to be tested through their counselor. At that time the student will be provide a list of requirements and scheduled for the required assessment test. Upon successfu completion of the assessment test the student will be admitted to the degree program o their choice.

AUTHENTICATION:

This document is accepted as the 2+2 Electronics Program Articulation Agreement existing between Cooke County College, Gainesville, Texas and Gainesville Independent School District, Gainesville, Texas.

President,

Cooke County College

Date May 24, 1989

Superintendent,

Gainesville ISD

Date May 24, 1989

GAINESVILLE HIGH SCHOOL
EVALUATION CRITERIA SCALE

High Low		
(4) 3 2 1 0	1.	Equipment needs have been established in careful relationship to the proposed instructional program.
(4) 3 2 1 0	2.	A bibliography of related instructional resources needed for program support (books, A.V. materials, etc.) has been established.
(4) 3 2 1 0	3.	Planned courses are properly sequenced.
(4) 3 2 1 0	4.	Planned courses are competency based.
(4) 3 2 1 0	5.	Procedures for student evaluation are included in each course.
4 3 (2) 1 0	6.	A student tracking system has been established.
4 3 (2) 1 0	7.	Competency profiles for each student are included in the model program plan.
(4) 3 2 1 0	8.	Articulation plans between the local ISD's and post-secondary institutions are in place.
(4) 3 2 1 0	9.	Course syllabi are complete.
4 3 2 (1) 0	10.	Clearly written program goals and objectives, considering the needs and interests of students have been developed.
4 3 (2) 1 0	11.	Student performance objectives are considered in the development of program goals and objectives.
(4) 3 2 1 0	12.	Curriculum is relevant to current industry.
4 3 (2) 1 0	13.	Written instructional objectives have been developed, and they contain a description of standards or level of performance required of students.
4 3 2 (1) 0	14.	Completion of courses provides the student with skills required for entry level employment.
4 3 (2) 1 0	15.	Standards for measuring level of performance have been identified and are consistent with instructional objectives.
(4) 3 2 1 0	16.	Need for the program has been established through collaborative efforts of the local Independent School District, Post-Secondary Institutions, Texas Education Agency and potential employers.
4 (3) 2 1 0	17.	Thorough evaluation of similar existing programs is evident.
(4) 3 2 1 0	18.	The cooperating institutions have committed enough resources to sufficiently develop a model 2+2 Electronics Program.

SCALE

High	Low		
(4)	3 2 1 0	19.	Evide: exists that suggestions and recommendations of the steering committee have been included in the program development process.
4	(3) 2 1 0	20.	Instructional facilities, including both classroom and laboratory space have been carefully designed.
(4)	3 2 1 0	21.	Procedures for program review and modification have been established.
4	(3) 2 1 0	22.	Overall program evaluation.

Thomas M Colbath
Mr. Tom Colbath

B N Dean
Dr. Bill Dean

Barbara Hazelwood
Dr. Barbara Hazelwood

J E Logswell
Dr. J.E. Logswell

EVALUATION COMMITTEE RECOMMENDATIONS

ITEM # 5	Provided discussed charges in grading system are implemented.
ITEM # 6	Needs tracking beyond Lone Star Tracking System.
ITEM # 7	Need to determine whether this program is to be under industrial umbrella or as new designation. If new, a new Competency Profile must be prepared and submitted.
ITEM # 10	Goals need to be less broadly defined and objectives be more specifically stated.
TEM # 11	Methods for measuring the student's competency in the defined objectives have not been established. The objectives are found under Tab #9/14 rather than Tab #11.
ITEM # 13	Same comments as # 11.
ITEM # 14	Rating is based upon ONLY completion of the High School portion of the program. This would convert to a "4" upon completion of the entire 2+2 Program.
ITEM # 15	Same comments as # 11.
ITEM # 17	This item needs to be documented.
ITEM # 20	More detail is needed for lab layout i.e.dimensions, electrical power distribution and audio/visual provisions.

COOKE COUNTY COLLEGE
REBUTTAL OF THE EVALUATION
OF
A MODEL 2+2 ELECTRONICS TECHNOLOGY PROGRAM
DEVELOPMENT PROJECT

The following actions have been taken in response to the evaluation of the Model 2+2 Electronics Technology Program Development Project conducted by the Evaluation Committee on May 22, and 23, 1989.

ITEM # 5 The suggested changes in the grading system have been incorporated in the Project Syllabi.

ITEM # 6 Lone Star Tracking will be used for students that are enrolled in Cooke County College and supplemented by a follow-up system identified as Tex-Sis for graduates and non-returning students. A similar tracking system will be implemented at Gainesville High School as outlined in this document.

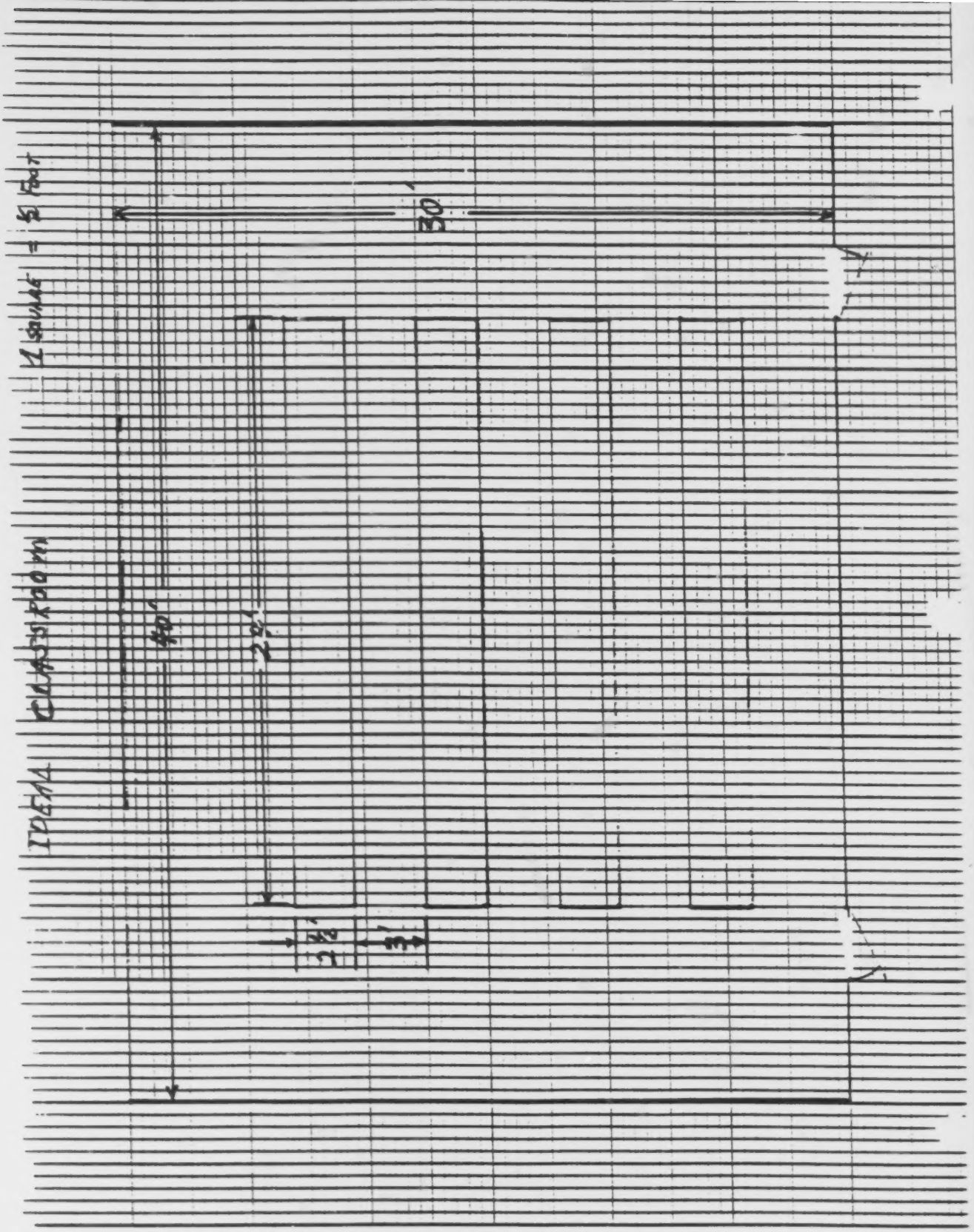
ITEM # 7 Determination was made by Mr. Tom Loftin that the program will not fall under the Industrial umbrella. The program will fall under Technology and course titles will have codes assigned upon the completion of this pilot project.

ITEM # 10 Goals and Objectives were embedded in the program descriptions and Syllabi. A separate page of Goals and Objectives were generated and incorporated for clarity.

ITEM # 14 The intent of this program development was to provide two exit points those being High School and College. The evaluators assumed the exit point to be at the College level with skills for fully qualified Electronics Technician entry levels. The intent of the high school exit point was to provide students with entry level skills that would increase the employability of the high school student in Electronics related jobs classified between non-skilled and fully-skilled. This program certainly will fulfill that goal and provide the foundation to support the evaluators comment of converting this rating to 4 upon completion of the college degree.

TEM # 17 Sufficient documentation will be included in the final product in the form of Timeline. Comments were made by evaluators that it was obvious that the suggested evaluation had been done but written documentation should be more complete.

ITEM # 20 The architectural firm of SHWC has been contracted to develop plans for the construction of lab facilities to be built to the college specifications. Preliminary plans are included.


1 square = 5 feet
30'
40'
24'
2'
3'
IDEAL CLASSROOM

2 + 2 ELECTRONICS
PROGRAM SUPPORT EQUIPMENT
GAINESVILLE INDEPENDENT SCHOOL DISTRICT
PRIORITY ONE RECOMMENDATION

ITEM	QUANTITY	DESCRIPTION	COST/UNIT	TOTAL/COST
1	5	NIDA Model 130 Test Console		
2	1	NIDA Model 130C Test Console		
3	5	NIDA DC Circuit Card Sets		
4	1	NIDA CAI DC Circuit Card Sets		
5	5	NIDA AC Circuit Card Sets		
6	1	NIDA AC Circuit Card Set		
7	5	NIDA Analog Circuit Card Sets		
8	1	NIDA CAI Analog Circuit Card Set		
9	5	NIDA Digital Circuit Card Sets		
10	1	NIDA CAI Digital Circuit Card Set		

DC Circuit CAI Program Masters
AC Circuit CAI Program Masters
Analog Circuit Program Masters
Digital Circuits Program Masters
Divided by 2

Total Delivery Systems
Total Test Equipment
Total Instructor Work Station

Principals of Technology

$ 73,199.

NOTE:Furniture
6 Tables
12 Chairs

7,500.

$ 80,699.

2 + 2 ELECTRONICS
PROGRAM SUPPORT EQUIPMENT
GAINESVILLE INDEPENDENT SCHOOL DISTRICT
PRIORITY ONE RECOMMENDATION

ITEM	QUANTITY	DESCRIPTION	COST/UNIT	TOTAL/COST
1	5	NIDA Model 130 Test Console		
2	1	NIDA Model 130C Test Console		
3	5	NIDA DC Circuit Card Sets		
4	1	NIDA CAI DC Circuit Card Sets		
5	5	NIDA AC Circuit Card Sets		
6	1	NIDA AC Circuit Card Set		
7	5	NIDA Analog Circuit Card Sets		
8	1	NIDA CAI Analog Circuit Card Set		
9	5	NIDA Digital Circuit Card Sets		
10	1	NIDA CAI Digital Circuit Card Set		

DC Circuit CAI Program Masters
AC Circuit CAI Program Masters
Analog Circuit Program Masters
Digital Circuits Program Masters
Divided by 2

Total Delivery Systems
Total Test Equipment
Total Instructor Work Station

Principals of Technology

TOTAL $ 73,199.

NOTE:Furniture
6 Tables
12 Chairs 7,500.

$ 80,699.

INSTRUCTOR QUALIFICATION
2+2 PROJECT

Faculty authorized to teach courses under the **2+2 Articulation Agreement** at the secondary level, and post-secondary level must possess the qualifications as outlined below:

SECONDARY SCHOOL:

I. B S in Electronics or related field from an accredited institution.

Three years of full time, wage earning experience in the occupation to be taught.

Two years successful experience teaching Trades and Industry while on Emergency Teaching Permits.

Six specified courses of professional teacher education.

Approval of Statement of Qualifications.

II. AAS in Electronics from an accredited institution.

Three years of full time, wage earning experience in the occupation to be taught.

Two years successful experience teaching Trades and Industry while on Emergency Teaching Permits.

Six specified courses of professional teacher education.

Approval of Statement of Qualifications.

POST SECONDARY:

I. GENERAL SUBJECT COURSES

A. Meet the minimum certification standards of the Texas Higher Education Coordinating Board for the course taught.

II. ELECTRONICS COURSES

A. Meet the minimum certification standards of the Texas Higher Education Coordinating Board for vocational/technical instructor in the subject area taught.

B. Must have a combination of five years work experience in the subject area and/or teaching experience in the subject area.

RETROSPECT

Through the vision of hindsight we are able to see clearly the shorter and more efficient path to success in the completion of the final product of this grant.

To the Coordinating Board, success is a guide to assist other institutions to efficiently develop similar Articulated Programs.

To the two institutions and their constituents, success is a new emerging, fully articulated electronics program that will set the tone of Technical Education for the foreseeable future.

It is the hope of all who have labored in this effort that those who undertake similar projects will also meet with similar success.

With that in mind, we wish to offer a bit of advice and yes a caveat or two.

RECOMMENDATIONS

A. Turf has not been a problem in this project and should never be when engaged in the development of educational opportunities of our students. However it can be and is not always recognizable.

B. Activities which we would prefer to do differently, if it were within our power to do so, would be as follows:

1. We would go directly to the chief executive officer of industries within the discipline area in our search for committee members.

   Please do not misunderstand. The support and dedication given to this project by each committee member was simply outstanding. The quality of the committee member may be overshadowed by the incumbrance placed on that committee member to arrange time off from employment for committee activities. A fringe benefit from the suggested action would encourage a more active participation by the industry as a whole.

2. We would not ever schedule a committee meeting during the same evening as a joint Articulation and Steering Committee meeting. This practice will lead to mis-communication especially if an individual serves on both committees.

3. Work should continue by the Texas Education Agency and the Texas Higher Education Coordinating Board to bring the concurrent credit under the same umbrella as the articulated credit described in the Articulation Agreement found in this document.

CAVEATS

1. Do not allow existing school laws and interpretations of those laws to dictate the development of a new innovative program.

2. Establish realistic prerequisites and use them without exception.

TEXAS EDUCATION AGENCY

Standard Application System

Notice of Grant Award for Programs Funded Under SAS

Applicant (Eligible Recipient) _____ County/District Number _____

☐ New Application
☐ Amended Application No

This will advise that the Application for Fiscal Year 198___ has been approved in the following amounts contingent upon the availability of funds to the Texas Education Agency.

1. Doc No.	Name of Funding Source (A)	Revenue Code (B)	SOF No (TEA) (C)	Project No Assigned by TEA (D)	Begin. Date of Project (E)	End Date of Project (F)	Previously Approved (G)	Increase (Decrease) (H)	Approved Amount (I)	Tent Alloc (J)	TEA USE ONLY Cash Pmt Month (K)	%
							$ 0					

2. Applicant's Standard Application System (Form SAS-____). Document Control Number _____ as amended by Agency, is attached and hereby incorporated by reference and, therefore, made a part of this grant award. The contents of this SAS is determined by the letter X placed in the appropriate column of Section B on the General Information page of this SAS, and any written incorporations by reference found on these Schedules. Also incorporated by reference into this grant award are the "Statement of Conditions" and "Other Statements of Provision or Assurance" printed on the back of this grant award form or elsewhere in the incorporated Application.

3. **Offer Accepted By Grantee**

The signature of the Applicant's authorized officer contained on the Applicant's Application referred to in 2. above, is hereby incorporated by reference and made a part of this Grant Award Contract.

4. **Acceptance Approved By Grantor**

Signature of Commissioner of Education or Designee
Texas Education Agency

Date

Distribution:
White—TEA
Green—Accounting
Canary—Grantee
Pink—Division
Goldenrod—Document Control

SAS (01)

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TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project
School Year 1988-89
SCHEDULE #1—General Information

249-901
County-District

994200677
Project No. (Assigned by T

1. Applicant Agency:
(Name, Address, City, State, Zip)
Gainesville ISD
1201 Lindsay
Gainesville, Texas 7626.0

2. Applicant Contact Person:
(Name, Title, Address (if different))
Tom Loftin,
Assistant Superintendent

Phone (817 665-4362

3. Purpose of Application:
☒ New Application
☐ Amended Application No. _____

RFA-701-88-017

4. Use of the Standard Application System: This system provides a series of standard schedules to be used as formats by applicants who r for funds administered by the Texas Education Agency. If additional clarification is needed, please call (512) 463-9446.

5. Program Authority: Public Law 98-524, Title II
☒ A Curriculum Development
☐ B Personnel Development
☐ C Program Development

Title of Project A Model Secondary/Postsecondary 2+2 Program to Prepare Students for Employment RFA# -01

6. Index to this Application: An X has been placed in the (X) column to indicate each Schedule that must be submitted as a part of the applica The applicant must place an X in the (X) column by each additional Schedule required to complete the application. For amendments, the appli must place an X in the Amend. column next to the Schedule No. being submitted with an amendment to this application.

Sch. No.	Schedule Name	(X)	Amend.	Sch. No.	Schedule Name	(X)	Amd
1	General Information	X	X	4	Program Abstract	X	
2	Certification for Cooperative Projects	N/A		4A	Program Needs Assessment	N/A	
3	Budget Summary	X		4B	Program Narrative/Description	X	
3A	Amended Budget Summary	X		4C	Program Evaluation Design	X	
	Support Schedules for—						
3B	Payroll Costs 6100	X					
3C	Purchased and Contracted Services 6200	X					
3C.1	Request for Contracted Consultant Services	X					
3D	Supplies and Materials 6300	X					
3E	Other Operating Expenses 6400	X					
3F	Lease Purchase—Construction/Remodeling 6512, Lease Purchase—Furniture and Equipment 6512 and Capital Outlay—Construction/Remodeling 6620	N/A					
3G	Capital Outlay—Furniture and Equipment 6630	N/A		6	Provisions & Assurances	X	N

Certification and Incorporation

7. I hereby certify that the information contained in this application is, to the best of my knowledge, correct and that the local education agency r above has authorized me as its representative to obligate this agency. I further certify that any ensuing program and activity will be con in accordance with all applicable Federal, State, and local laws and requirements, the Provisions and Assurances, and the schedules a as indicated above. It is understood by applicant that this application constitutes an offer, and if accepted by Agency or renegotiated to tance, will form a binding agreement.

Typed Name and Title of Authorized Official	Telephone Number	Date Signed	Signature
Charlie Uselton, Sup't.	817/665-4362	8/2/88	Charlie L. Uselton

By May 20, 1988
Return 10 copies of the application with two original signatures to:
Texas Education Agency
Document Control Center
William B. Travis Bldg., Rm. 6-108
1701 N. Congress Avenue
Austin, Texas 78701

550/8/4/88-055
TEA DOCUMENT CONTRO

SAS

Amendment # _____
(Complete only on amendments)

TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project
School Year 1988-89

SCHEDULE #3—Budget Summary

049-901
Co.-Dist.

Project No. (Assigned by T
5/2/88
Date Submi

Instructions
1. Report whole dollar amounts only. Omit decimals.
2. Totals from all Budget Schedules must appear on this Schedule.

Program Authority: Public Law 98-524, Title II

Line No.	Class/Object Description	Schedule # Number	C/Obj. Code	Budgeted Expenditures Federal	Nonfederal
01	Payroll Costs	3B	6100	$ 44,207	$
02	Purchased and Contracted Services	3C	6200	3,200	
03	Supplies and Materials	3D	6300	540	
04	Other Operating Expenses	3E	6400	2,050	
05	Lease Purchase—Construction/Remodeling, Furniture and Equipment	3F	6512		
06	Capital Outlay—Construction/Remodeling	3F	6620		
07	Capital Outlay—Equipment and Furniture	3G	6630		
08	Total Direct Costs (Sum of lines 1-7)			$ 49,997	$
09	Flow Thru-Out (Other Uses)		6991		
10	Indirect Costs (Not to Exceed 8%)				
11	Total Budget Costs			$ 49,997	$

NOTE: Reimbursement will be computed on total approved expenditures, federal plus nonfederal. The reimbursement percentage for feder will be the same as the ratio of approved federal expenditures to total approved expenditures.

SAS

Amendment #
(Complete only on amendments)

INSTRUCTIONS
1. Report whole dollar amounts only
   Omit decimals

TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project
School Year 1988-89

SCHEDULE #3A—Amended Budget Summary

N/A

049 901
County District No.

Project No. (Assigned By TEA)
8/2/88
Date Submitted

Program Authority: Public Law 98-524, Title II

Line No.	Class/Object Code	Federal Previously Approved Budget (A)	Amount Deleted (B)	Amount Added (C)	Federal New Budget (D)	Justifications for Budget Amendments (Please Type) (E)
01	6100	$	$	$	$	
02	6200					
03	6300					
04	6400					
05	6512					
06	6620					
07	6630					
08	Total Direct Costs	$	$	$	$	
09	Flow Thru Out 6991					
10	Indirect Cost (Not to Exceed 8%)					
11	Total Budget Costs	$	$	$	$	

SAS 10/1/89

Amendment #
(Complete only on amendments)

TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project
School Year 1988-89

SUPPORT SCHEDULE #3B—Payroll Costs 6100

059 901
Co Dist No

Project No (Assigned by TEA)

8/2/88
Date Submitted

Page 1 of 1

Instructions
1 Report whole dollar amounts only
Omit decimals
2 On line #01-09 report FTE or Payroll
Cost as indicated in the instructions
3 On line #10 enter total cost

Program Authority Public Law 98 524, Title II

93

Line No.	Name, Title of Position	% of Time Funded	Months or Hours Employed	Monthly Salary or Hourly Wage	Total Salary or Wages	Fringe Benefits	Total Federal	Total Nonfederal
01	Project Coordinator (to be named)	50	10	$ 2,900	$ 14,5000	$ 1,750	$ 16,249	$
02	Instructor (to be named)	100	10	2,200	22,000	2,279	24,279	
03	Secretary (to be named)	25	10	1,358	3,395	293	3,688	
04								
05								
06								
07								
08								
09							$ 44,207	$
10	Total Cost							

SAS 303R89

Amendment # _____
(Complete only on amendments)

TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project
School Year 1988-89
SUPPORT SCHEDULE #3C
Purchased and Contracted Services 6200

049-901
County-District N

Project No. (Assigned by TEA
8/2/88
Date Submit

Page _____ of _____

INSTRUCTIONS
1. Report whole dollar amounts only. Omit decimals.

Program Authority: Public Law 98-524, Title II

Line No.	Type and Description of Service and/or Product to Be Delivered	Quantity	Rate/Cost Per Unit	Budgeted Expenditu	
				Federal	Nonfed
01	Consultants	5 days	$ 350	$ 1750.	$
02	Business & Industry Consultants	3½ days	415	1450.	
03					
04					
05					
06					
07					
08					
09					
10	TOTAL COST			$ 3200.	$

SAS

Amendment # _____
(Complete only on amendments)

TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project
School Year 1988-89
SCHEDULE #3C.1—Request for Contracted Consultant Services

049-901
County-District No.

Project No. (Assigned by TEA)

8/2/88
Date Submitted

a. Program Authority: Public Law 98-524 Title II

b. This contract is budgeted on line # 1 of Support Schedule #3C

1. **Consultant:**

Name unknown

SS/ID Number _____

Address _____

2. **Qualifications of Consultant** (including certification if applicable):

Vocational director from public school system with established electronics programs or vocational dean from community college with successful articulati agreements in place with ISD's.

3. **Expenses:**

a. **Fee to Be Paid:**

$ 200 per day for a total of 5 days. **Total Fee:** $ 1,000

b. **Other Costs:**

Travel: $ 500, Per Diem: $ 250, Other: $ _____. **Total Other Costs:** $ 750

c. **Total Contract Amount:** $ 1,750

4. **Work to Be Performed:** make suggestions for program content. Advise on referencir of courses. Technical assistance.

SAS-303

Amendment # _____
(Complete only on amendments)

TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project
School Year 1988-89
SCHEDULE #3C.1—Request for Contracted Consultant Services

049-901
County-District No.

Project No. (Assigned by TEA)

3/2/88
Date Submitted

a. Program Authority: Public Law 98-524, Title II

b. This contract is budgeted on line # 2 of Support Schedule #3C.

1. **Consultant:**

Name: Unknown

SS/ID Number: _____

Address: _____

2. **Qualifications of Consultant** (including certification if applicable):

Personnel directors or unit managers from well-established electronics manufacturing facilities, i.e., Boeing, Texas Instruments, Collins Radio or General Dynamics.

3. **Expenses:**

a. **Fee to Be Paid:**

$ 200 per day for a total of 3½ days. **Total Fee:** $ 700

b. **Other Costs:**

Travel: $ 500, Per Diem: $ 250, Other: $ _____. **Total Other Costs:** 750

c. **Total Contract Amount:** $ 1,450

4. **Work to Be Performed:** Assist staff in designing curriculum to meet knowledge and skill requirements of business and industrial firms.

SAS-303P

Amendment # _____
(Complete only on amendments)

TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project
School Year 1988-89
SUPPORT SCHEDULE #3D—
Supplies and Materials 6300

049-901
County-Distric

Project No. (Assigned by
8/2/88
Date Subm

INSTRUCTIONS
1. Report whole dollar amounts only. Omit decimals

Program Authority: Public Law 98-524, Title II

Line No	Description of Expense Items	Budgeted Expenditures	
		Federal	Nonfederal
01	General Office Supplies	$ 540	$
02			
03			
04			
05			
06			
07			
08			
09			
10	TOTAL COST	$ 540	$

SAS

Amendment # _____
(Complete only on amendments)

TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project
School Year 1988-89
SUPPORT SCHEDULE #3E—
Other Operating Expenses 6400

049-901
County-District No.

Project No. (Assigned by TEA)
872788

Date Submitted

Page 1 of 1

INSTRUCTIONS
1. Report whole dollar amounts only. Omit decimals.

Program Authority: Public Law 98-524, Title II

Line No.	Description of Expense Items	Budgeted Expenditures	
		Federal	Nonfederal
01	Instate travel of coordinator and/or teacher	$ 450	$
02	Travel of Steering Committee	1600	
03			
04			
05			
06			
07			
08			
09			
10	TOTAL COST	$ 2050.	$

SAS-303R

Amendment # _____
(Complete only on amendments)

TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project

School Year 1988-89
SUPPORT SCHEDULE #4—
Program Abstract

049-901
County-District No.

Project No. (Assigned by TEA)

5/2/88
Date Submitted

Instructions: This abstract form was developed by the Office of Vocational and Adult Education, U.S. Department of Education, to provide detailed information on federally funded projects. It is required for all program improvement projects. Fill in appropriate information for all items except 1, 2, and 9

Part A—Project Identification

1. Name of State Submitting
Texas

2. Type (Check One)
☒ Contract ☐ Contract No. (Specify) _____
☐ In-House ☐ Project No. (Specify) _____

3. Title of Project
2 Plus 2 - Electronics Program Development

4. Principal Investigator(s) and Organization(s)
Gainesville ISD

Telephone No. (Include Area Code)
817/665-4362

5. Address (Include Number, Street, City, State, and ZIP Code)
1201 Lindsay Gainesville, Texas 76240

6. Organization Type (Check Primary Group(s))
☐ College/University
☒ Local Education Agency
☐ Intermediate Service Agency
☐ Indian Tribe
☐ Professional Organization
☐ Community-Based Organization
☐ Individual
☐ State Education Agency
☐ Small Business
☐ Non-Profit
☐ Other (Specify) _____

7. Funding Period
Starting Date 7/1/88 Ending Date 6/30/89

8. Source of P.L. 98-524, Title II Funds (Federal Funds Only)
A. Curriculum Development $ 49,997
B. Personnel Development $ _____
C. Other Program Improvement $ _____

9. Charged to Federal Appropriation Year(s)

10. Level of Activity's Impact (Check Primary Level)
☐ Adult ☒ Secondary
☒ Post Secondary ☐ Other (Specify) _____

11. Location
☐ Isolated Rural ☐ Inner City
☐ Suburban ☐ Other (Specify) _____

12. Special Population Target Groups (Check Relevant Group(s))
☐ Handicapped
☐ Disadvantaged
☐ Limited English Proficiency
☐ Persons in Need of Retraining
☐ Persons in Correctional Institutions
☐ Single Parents/Displaced Homemakers
☐ Persons in Non-Traditional Occupations
☐ Displaced Workers
☐ Persons in Programs to Eliminate Sex Bias/Stereotyping
☒ Other (Specify) Secondary - Post Secondary Stude

No further monies or other benefits may be paid out under this program unless this report is completed and filed as required by existing l and regulations.

(over)

SAS-3033

Part B—Project Description Abstract

(Fill in the following project description.)

1. OBJECTIVES (Describe the major objectives of this project.)

1. To develop a secondary competency based occupational training program/curriculum linked to and in cooperation with a two year postsecondary developmental program.

2. To develop an evaluation, student monitoring and follow-up system.

2. PROCEDURES (Describe the processes to be used in implementing and evaluating this project.)

Gainesville ISD, in cooperation with Cooke County College, proposes to develop a model 2-2 associate degree electronics program. The program will develop an Electronics Manufacturing Technology to help satisfy the demand for well-trained specialists at currently operating electronics related industries and two new electronics manufacturing firms presently under construction in Cooke County College and Gainesville ISD's service area.

See Attachment B-2 for processes for implementing and evaluating this project.

3. PRODUCT(S) TO BE DELIVERED (Indicate type, quantity and recipients. R&D outcomes may be a product, a model, a policy finding, or a research result. R&D products are tangible, transportable, self-contained outcomes of the R&D process, source: adapted from "The R&D Exchange: An Emerging Effort," National Institute of Education, 1978.)

1. One (1) finished copy and one (1) camera ready copy of any product developed in the project.

2. Two (2) copies of quarterly progress reports.

3. Five (5) copies of a comprehensive final report of the project.

4. QUALITY CONTROL OF PRODUCT(S) (Describe processes to be used to assure high quality product(s).)

An Evaluation Committee, consisting of two occupational/technical deans and two secondary curriculum specialists who are responsible for administering electronic or technical programs, will evaluate the program for curriculum quality; appropriateness of classroom and laboratory space and equipment; student access to the program; quality of promotional literature; and degree of involvement by external agencies.

See attachment B-4 for specific evaluation criteria.

Signature of Vocational Education Program Improvement Coordinator, Texas Education Agency	Date

SAS-303

Attachment B-2 PROCEDURES

Procedures	Performance Measures	Timelines
1. Employ a full-time coordinator to develop and implement a model 2+2 electronics technology program. Provide the new coordinator with the results of the survey conducted during the current school year concerning projected personnel needs for the next five years.	A Project Coordinator is employed by Cooke County College and Gainesville ISD.	September 21, 198
2. An instructor to be hired by Gainesville ISD to develop a high school curriculum with relevant academic components in reading, writing, math, and science. Also, computer usage and general employability skills will be included.	An instructor is employed by GISD.	September 21, 198
3. Establish linkage with private industry, public schools, Chambers of Commerce, private industry councils, other post-secondary institutions with established electronics programs, and representatives from the Coordinating Board and the Texas Education Agency. The news media will be kept aware of the program's progress.	A Steering Committee with representatives from business, industry, secondary education, post-secondary education, news media, local Chambers of Commerce, private industry councils, the Texas Education Agency and the Coordinating Board is established. The committee will assist with analyzing surveys of local businesses and industries to determine program employment needs and job competencies.	October 17, 1988
4. A Steering Committee will advise and assist project staff members in identifying program objectives; designing and developing competency-based curriculum for basic, core and specialty courses; developing course outlines and student competency profiles; identifying required instructional resources including instructional materials, facilities and equipment; identifying courses for delivery at secondary (Grades 11-12) and post-secondary (Grades 13-14) levels; and developing assessment instruments for student placement. The Committee will also prepare syllabi for each course, construct concept modules where appropriate, and make recommendations concerning expected student prerequisites and student exit skills at each course level.	The Steering Committee will review and make recommendations concerning work performed by the project staff.	January 30, 1989

Attachment F (continued) Procedures

Procedures	Performance Measures	Timelines
5. Develop a list of curriculum reference materials.	Revisions completed after consultation with Steering Committee.	March 1, 1989
6. Develop a competency profile for secondary and post-secondary programs.	Revisions completed after consultation with Steering Committee.	March 15, 1989
7. Evaluate the curriculum.	Revisions completed after consultation with Steering Committee.	March 15, 1989
8. Develop a system to track students from program entry through first year of employment and develop a process for on-going evaluation and improvement of instructional components.	Project staff will make recommendations for appropriate tracking and evaluation mechanisms to be approved by the Steering Committee.	April 15, 1989
9. Refine instructional materials for first year of secondary program.	Project staff, with assistance from the Steering Committee, will finalize the instructional materials.	May 1, 1989
10. Finalize laboratory and classroom equipment/tools needs for both secondary and post-secondary classrooms and design appropriate layout for classroom and laboratory space which will include cost figures.	The Project Coordinator and members of the Steering Committee will make on-site visits to other educational and industrial training sites and then make recommendations concerning appropriateness of layout and design of laboratory and classroom equipment/tools needs.	May 1, 1989
1. Develop recommended teacher approval criteria.	Revisions will be made after Steering Committee review. Then will be submitted to Texas Education Agency and the Texas Higher Education Coordinating Board for review.	May 1, 1989
2. Program staff, with assistance from CCC's community relations staff, will develop specific promotional literature. Primary emphasis will target public school students grades 7-10.	Promotional literature reviewed and approved by the Steering Committee.	May 22, 1989
3. Promotional literature revisions as recommended by the Steering Committee is completed.		May 29, 1989
4. Finalize plans for equipping classroom and laboratories	Administrative review of plans.	June 6, 1989

Attachment (continued) Procedures

Procedures	Performance Measures	Timelines
15 Evaluation of project.	An Evaluation Committee, consisting of two occupational/technical deans and two secondary curriculum sepcialists who are responsible for administering electronics or technical programs, will evaluate the program for curriculum quality; appropriateness of classroom and laboratory space and equipment; student access to the program; quality of promotional literature; and degree of involvement by external agencies. Please refer to Part B 4 for specific criteria.	June 5, 1989
16 Plan for implementation of program.	GISD Board of Trusteees reviews and approves program start up.	June 19, 1989
17 Final first year report completed and suggested procedures for follow-up delineated.	Final report to the Texas Education Agency	June 30, 1989
18 Implement secondary curriculum.	Enroll students in secondary curriculum.	September, 1989

BEST COPY AVAILABLE

PROJECT DESCRIPTION ABSTRACT 3 (a)

Products to be delivered:

A project coordinator is employed by Cooke County College and GISD.

An instructor to be hired by Gainesville ISD to develop a high school electronic curriculum with relevant academic components in reading, writing, math and science. Also, computer usage and general employability skills will be included.

A Steering Committee with representatives from businesses, industry, secondary education, post-secondary education, local Chambers of Commerce, private industry councils, the Texas Education Agency and the Coordinating Board is established. The Committee will assist with analyzing surveys of local businesses and industri to determine program employment needs and job competencies.

Project staff will make recommendations for appropriate tracking and evaluation mechanisms to be approved by the Articulation Committee.

Project staff, with assistance from the Articulation Committee, will finalize the instructional materials.

The Project Coordinator and members of the Steering Committee will make on-site visits to other educational and industrial training sites and then make recommen concerning appropriateness of layout and design of laboratory and classroom, and equipment needs.

Promotional literature reviewed and approved by the Steering and Articulation Committees.

An Evaluation Committee, consisting of two occupational/technical deans and two secondary curriculum specialists who are responsible for administering electroni or technical programs, will evaluate the program for curriculum quality; appropriateness of classroom and laboratory space and equipment; student access to t program; quality of promotional literature; and degree of involvement by externa agencies.

Enroll students in secondary curriculum.

Amendment # _____
(Complete only on amendment(s))

TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project
School Year 1988-89
SCHEDULE #4B—Program Description

049-901
County-District No.

Project No. (Assigned by TEA)
8/2/88
Date Submitted

Program Authority: Public Law 98-524, Title II

Narrative/Description of the Program or Component (Use additional copies of this form as necessary.)

Gainesville Independent School District, in cooperation with Cooke County College, proposes to develop a model 2+2 associate degree electronics program. The program will develop an Electronics Manufacturing Technology to help satisfy the demand for well-trained specialists at currently operating electronics related industries and two new electronics manufacturing firms presently under construction in Cooke County College and Gainesville ISD's service area.

Because of the increasingly sophisticated demands on electronic specialists, student must master ever more difficult competencies in mathematics, including calculus, electronics theory, physics, etc. As a result, the underprepared student faces a nearly impossible taks of achieving the required competencies in a two-year time frame. The difficulty is well-documented through high attrition figures throughout the community college's electronics programs. As a result, a 2+2 integrated curriculum, which gives a student an optimum chance for success, is not only desirab but may well be crucial if the need for these specialists is to be met.

Discussion initiated by the college administration with Cooke County College Board of Trustees; the chief administrators of the Gainesville ISD; representatives from industrial firms, and the Gainesville area Chamber of Commerce have proven a growing need for electronic specialists in the immediate area. The construction of two electronics manufacturing plants (Texas Instruments just north of Denton and Boeing Electronics just south of Denton) added to the importance of this proposal. A surve conducted by Cooke County College during the current year of projected manpower and training needs in Cooke, Denton, and Montague counties confirms electronics technology as one of the technical areas offering the greatest prospects for expansion and additional jobs.

A Steering Committee comprised of representatives from the college, Gainesville ISD business and industry, new media, the local Private Industry Council, the Texas Education Agency and the Coordinating Board will be established. Its task will be to offer assistance in determining job market potential, as well as the kinds of skills mandated for employment in the area's emerging electronics industries and to identify elements for inclusion in the curriculum to be developed. This committee which includes private industry representatives, because of their experie will be expected to perform a leading role in recommending equipment/tools and in developing a line drawing for facilities and arrangement of equipment. The Steerin Committee will also review and evaluate each element of the curriculum and a competency profile for secondary and post-secondary programs before they are accept

Amendment # _____
(Complete only on amendments)

TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project
School Year 1988-89
SCHEDULE #4B—Program Description

049-901
County-District f

Project No. (Assigned by TF
8/2/88
Date Submi.

Page 2 of ___

Program Authority: Public Law 98-524 Title II

Narrative/Description of the Program or Component (Use additional copies of this form as necessary.)

as operational. This committee will decide at what levels appropriate courses should be offered and will review the criteria for teacher approval which will be submitted to Texas Education Agency and the Texas Higher Education Coordinating Board.

There is also recognition of the need for cross-utilization of personnel and facilities at both the high school and community college levels: in short, a removal of artificial barriers to utilize the best teacher at the best facility to give the student the greatest chance to achieve required competencies, without regard to his classification. The Steering Committee will also work toward involv industry in the instructional process through summer hire program, internships, part-time instruction, equipment loan, field trips, and guest lecture appearances This committee will also be instrumental in developing a tracking system for stude entering the program.

Once agreement is reached concerning the components of a model 2+2 electronics pro work will begin toward the construction of a curriculum. The curriculum will be divided into courses complete with course objectives, entrance and exit competenc concept modules, materials needed for instruction and selected references. The p will be designed to accommodate students qualified for advanced placement as well those needing remedial assistance. By starting this program at the 11th grade le and developing a well-articulated awareness campaign going back to 7th grade, tha highlights the needed mathematics skills for success in electronics and engineerir the high attrition rate endemic to many existing electronics programs should be avoided. An added benefit of a well-articulated program will be the enhancement of requisite skills for entry into engineering degree programs should a student ma that option upon completion of high school or any subsequent point.

Cooke County College and Gainesville ISD expect to hire a full-time program coordinator immediately upon approval of this grant. In addition, Gainesville IS plans to hire an instructor in the fall of 1988 to write curriculum. Target date for implementation of the program will be fall, 1989. The secondary curriculum will be operational beginning the second year, but the entire program will be sub to revision as needed, especially during the first years of operation. Because o the nature of 2+2 programs, a six-year cycle will be necessary for implementatio of all four years of the curriculum, together with the necessary follow-up activ.

S

BEST COPY AVAILABLE

Amendment # _____
(Complete only on amendments)

TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project
School Year 1988-89
SCHEDULE #4B—Program Description

049-80
County-District No.

Project No. (Assigned by TEA
3/2/88
Date Submitted

Program Authority: Public Law 98-524, Title II

Narrative/Description of the Program or Component (Use additional copies of this form as necessary.)

A student completing two years(secondary portion) of the 2+2 program will be employ in the field of electronics in one of the following occupations:

Electric Motor Repairer
Electric Appliance Repairer
Battery Tester
Electrical Line Splicer
Electric Motor Winder
Transformer Tester
Battery Parts Assembler
Electric Tool Repairer

A student completing the 2+2 program will be employable in the field of electronics in one of the following occupations:

Electricial Supervisor, Substation
Transformer Assembly Supervisor
Electricial Apprentice, Powerhouse
Corrosion - Control Fitter
Electric-Motor-and-Generator Assembler
Transformer Assembler
Wireworker Supervisor
Power-Transformer Repairer
Voltage Tester
Electric-Meter Installer
Testing-and-Regulating Technician
Supervisor, Electrical Assemblies
Assembler and Wirer, Industrial Equipment
Fabricator, Industrial Furnace
Supervisor, Major Appliance Assembly
Computer Technicians
Numerical Control Maintenance
Installation & Modification Technician
Electronic Bench Technicians
Microwave Installation & Maintenance
Automotive Electronics

Records of the planning and development process, along with the activities of the Steering Committee will be made a matter of record. They will be added to the developed curriculum, course syllabi, specified competencies at each course level and ancillary materials developed through this project. All materials related to the program will be printed, bound, and made available to the Coordinating Board, the Texas Education Agency, secondary institutions, and post-secondary institutions wishing to utilize it as a guide for similar endeavors.

Amendment # _____
(Complete only on amendments)

TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project
School Year 1988-89
SCHEDULE #4B—Program Description

049-901
County-District N

Project No. (Assigned by TE
8/2/88
Date Submitte

Page 4 of 4

Program Authority: Public Law 98-524, Title II

Narrative/Description of the Program or Component (Use additional copies of this form as necessary.)

It is expected that additional funding will be available in subsequent years for development and refinement of the curriculum. A tracking system to maintain accurate records of students entering, leaving, and completing the program is essential.

A follow-up study as suggested by the RFP will be conducted.

SA

PART 4-B: EVALUATION CRITERIA

1. Equipment needs have been established in careful relationship to the proposed instructional program.

2. A bibliography of related instructional resources needed for program support (books, A.V. materials, etc.) has been established.

3. Planned courses are properly sequenced.

4. Planned courses are competency based.

5. Procedures for student evaluation are included in each course.

6. A student tracking system has been established.

7. Competency profiles for each student are included in the model program plan.

8. Articulation plans between the local ISD's and post-secondary institutions are in place.

9. Course syllabi are complete.

10. Clearly written program goals and objectives, considering the needs and interests of students have been developed.

11. Student performance objectives are considered in the development of program goals and objectives.

12. Curriculum is relevant to current industry requirement.

13. Written instructional objectives have been developed, and they contain a description of standards or level of performance required of students.

14. Completion of courses provides the student with skills required for entry level employment.

15. Standards for measuring level of performance have been identified and are consistent with instructional objectives.

16. Need for the program has been established through collaborative efforts of the local Independent School District, Post-Secondary Institutions, Texas Education Agency and potential employers.

17. Thorough evaluation of similar existing programs is evident.

18. The cooperating institutions have committed enough resources to sufficiently develop a model 2 plus 2 electronics program.

19. Evidence exists that suggestions and recommendations of the steering committee have been included in the program development process.

20. Instructional facilities, including both classroom and laboratory space have been carefully designed.

21. Procedures for program review and modification have been established.

SCALE

High				Low
4	3	2	1	0

22. Overall program evaluation.

Amendment # _____
(Complete only on amendments)

TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project
School Year 1988-89
SCHEDULE #4C—Program Evaluation Design

049-901
County-District #

Project No. (Assigned by T
8/2/88
Date Submi

Program Authority: Public Law 98-524, Title II

Evaluation Design (Use additional copies of this form as necessary.)

Evaluation of each aspect of the proposal will take place throughout its develop
by the Steering Committee and by the Articulation Committee. Performance will be
measured against goals and timelines included in the operational format of this
proposal. A team comprised of occupational/technical administrators who are
each responsible for administering electronics programs at their own institution
will conduct the final on-site evaluation. They will evaluate the program for
curriculum quality; appropriateness of classrooms, laboratory space and equipmen
procedures for access and entry by students; quality of promotional literature;
and degree of involvement of external agencies.

SEE PART 4-B FOR ADDITIONAL EVALUATION CRITERIA

GENERAL INSTRUCTIONS FOR SCHEDULE #4C - PROGRAM EVALUATION DESIGN

1. Describe the procedures to be used in assessing and documenting the results of the project in terms of the achievement of the stated objectives.

TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project
School Year 1988-89
Schedule #6 - Provisions & Assurances

049-901
Co.-Dist. No.

Project No.
(Assigned by

Program Authority: PUBLIC LAW 98-524, Title II

Statement of Provisions and Assurances for the Program(s) in this Application:

A. As used in these Provisions and Assurances,
"Contract" means the entire document, whatever its name or form, of which these Provisions and Assurances and other attachments and schedules, if any, are a part;
"Agency" means the Texas Education Agency;
"Contractor" means the party or parties to this contract other than Agency;
"Project Administrator" means the person representing Agency or Contractor, as indicated by the contract, for the purposes of administering the contract project;
"Contract Project" means the purpose intended to be achieved through the contract of which these Provisions and Assurances are a part;
"Applicant" means the same as "Contractor";
"Application" means the entire package submitted by the Applicant including the schedules included in the application and so indicated on the General Information page of the application package;
"Grant" means the same as "Contract";
"Grantee" means the same as "Contractor";
"Grantor" means the same as "Agency".

B. This contract is executed by Agency subject to the availability of funds appropriated by legislative act for the purposes stated. All amendments and/or extensions or subsequent contracts entered into for the same or continued purposes are executed contingent upon the availability of appropriated funds. Notwithstanding any other provision in this contract or any other document this contract is void upon appropriated funds becoming unavailable. In addition, this contract may be terminated by Agency at any time upon notice to Contractor. Expenditures and/or activities for which Contractor may claim reimbursement shall not be accrued or claimed subsequent to receipt of such notice from Agency. This contract may be extended or otherwise amended only by formal written amendment properly executed by both Agency and Contractor. No other agreement, written or oral, purporting to alter or amend this contract shall be valid.

The signature on the General Information page indicates acceptance of these assurances.

SAS

C. Contractor shall hold Agency harmless from and shall indemnify Agency against any and all claims, demands, and causes of action of what ever kind or nature asserted by any third party and occurring or in any way incident to, arising out of, or in connection with any acts of Contractor, its Agents, Employees, and Subcontractors, done in the conduct of the contract project.

D. Contractor shall not assign or subcontract any of its rights or responsibilities under this contract, except as may be otherwise provided for in this contract, without prior formal written amendment of this contract properly executed by both Agency and Contractor.

E. Notwithstanding any other provision of this contract, Contractor shall not use or pay any consultant in the conduct of this contract project if the services to be rendered by any such consultant can be provided by Contractor's employees. Contractor shall, before retaining, contracting with, or incurring any obligation to pay any consultant to be paid more than $200 in any one day or $1,000 in total during the contract project, identify each such consultant in writing to Agency by name, address, Social Security or Employer Identification Number, qualifications, need for and proposed use of such consultant's services; and Contractor shall not, except as may be otherwise provided for in this contract, retain, contract with or incur any obligation to pay any such consultant without the prior written approval of the Commissioner of Education of Agency or his designee.

F. All encumbrances, accounts payable and expenditures shall occur on or between the beginning and ending dates of this contract. All goods must have been received and all services rendered during the contract period in order for the contractor to recover funds due. In no manner shall encumbrances be considered or reflected as accounts payable or as expenditures.

The signature on the General Information page indicates acceptance of these assurances.

G. Contractor shall maintain its records and accounts in a manner which shall assure a full accounting for all funds received and expended by Contractor in connection with the contract project. These records and accounts shall be retained by Contractor and made available for audit, by Agency and by others authorized by law or regulation to make such an audit, for a period of not less than seven (7) years from the latter of the date of completion of the contract project or the date of the receipt by Agency of Contractor's final claim for payment or final expenditure report in connection with this contract or if an audit has been announced the records shall be retained until such audit has been completed.

H. All materials, conceptions and products produced or conceived by Contractor, its employees, agents, consultants or subcontractors, arising out of the contract project shall be the sole property of Agency, and Agency shall have the exclusive right to copyright and patent these materials, conceptions and products, subject to applicable law. Contractor shall so bind all concerned.

I. If Contractor, in Agency's sole determination, fails or refuses for any reason to perform any of its obligations under this contract, Agency may impose such sanctions as it may deem appropriate, including but not limited to the withholding of payments to Contractor until Contractor complies, the cancellation, termination or suspension of this contract in whole or in part, and the seeking of other remedies as may be provided by this contract or by law. Any cancellation, termination or suspension of this contract, if imposed, shall become effective at the close of business on the day of Contractor's receipt of written notice thereof from Agency.

J. If this contract is canceled, terminated or suspended by Agency prior to its expiration date, the monetary value of services properly performed by Contractor pursuant to this contract shall be determined by Agency and paid to Contractor as soon as reasonably possible.

The signature on the General Information page indicates acceptance of these assurances.

K. If Agency determines that Agency is due a refund of money paid to Contractor pursuant to this contract, Contractor shall pay the money due to Agency within 30 days of Contractor's receipt of written notice that such money is due to Agency. If Contractor fails to make timely payment, Agency may obtain such money from Contractor by any means permitted by law, including but not limited to offset, counterclaim, cancellation, termination, suspension, total withholding and/or disapproval of all or any subsequent applications for said funds.

L. In the event of loss, damage or destruction of any property owned by or loaned by Agency while in the custody or control of Contractor, its employees, agents, consultants or subcontractors, whether the property is developed or purchased by Contractor pursuant to this contract or is provided by Agency to Contractor for use in the contract project, Contractor shall indemnify Agency and pay to Agency the full value of or the full cost of repair or replacement of such property, whichever is the greater, within 30 days of Contractor's receipt of written notice of Agency's determination of the amount due. If Contractor fails to make timely payment, Agency may obtain such money from Contractor by any means permitted by law, including but not limited to offset or counterclaim against any money otherwise due to Contractor by Agency.

M. In the conduct of the contract project, Contractor shall be subject to Texas State Board of Education policies, procedures, rules and regulations pertaining to this contract and the contract project, and to the laws of the State of Texas governing this contract and the contract project. This contract constitutes the entire agreement between Agency and Contractor for the accomplishment of the contract project. This contract shall be interpreted according to the laws of the State of Texas except as may be otherwise provided for in this contract.

The signature on the General Information page indicates acceptance of these assurances.

TEXAS EDUCATION AGENCY

Standard Application System (SAS)
Vocational Education Program Improvement Project
School Year 1989-90
SCHEDULE #1—General Information

049-901
County-District No.

00420030-58
Project No. (Assigned by TEA)

1 Applicant Agency (Name, Address, City, State, Zip)	2 Applicant Contact Person: (Name, Title, Address [if different])	3 Purpose of Application:
Gainesville ISD 1201 Lindsay Gainesville, Texas 76240	Tom Loftin, Assist. Sup't. Phone (817) 665-4362	[X] New Application [ ] Amended Application No. _____ RFA#-701-90-004

4 **Use of the Standard Application System:** This system provides a series of standard schedules to be used as formats by applicants who apply for funds administered by the Texas Education Agency. If additional clarification is needed, please call (512) 463-9446.

5 **Program Authority:** Public Law 98-524, Title II

- [X] A Curriculum Development
- [ ] B Personnel Development
- [ ] C Program Development

Title of Project: Continuation of a Model Secondary/Post Secondary 2 + 2 Program to Prepare Students for Employment in Electronics Technology

6. **Index to this Application:** An X has been placed in the (X) column to indicate each Schedule that **must** be submitted as a part of the application. The applicant must place an X in the (X) column by each additional Schedule required to complete the application. For amendments, the applicant must place an X in the Amend. column next to the Schedule No. being submitted with an amendment to this application.

Sch. No.	Schedule Name	(X)	Amend.	Sch. No.	Schedule Name	(X)	Amend.
1	General Information	X	X	4	Program Abstract	X	
2	Certification for Cooperative Projects	N/A		4A	Program Needs Assessment	N/A	
3	Budget Summary	X		4B	Program Narrative/Description	X	
3A	Amended Budget Summary	X		4C	Program Evaluation Design	X	
	Support Schedules for—			5	Private Nonprofit Schools	N/A	
3B	Payroll Costs 6100	X					
3C	Purchased and Contracted Services 6200	X					
3C.1	Request for Consultant Services	X					
3D	Supplies and Materials 6300	X					
3E	Other Operating Expenses 6400	X					
3F	Lease Purchase—Construction/Remodeling 6512, Lease Purchase—Furniture and Equipment 6512 and Capital Outlay—Construction/Remodeling 6620	N/A					
3G	Capital Outlay—Furniture and Equipment 6630	N/A					
3H	Other Uses 699X	N/A		6	Provisions & Assurances	X	N/A

Certification and Incorporation

7 I hereby certify that the information contained in this application is, to the best of my knowledge, correct and that the local education agency named above has authorized me as its representative to obligate this agency. I further certify that any ensuing program and activity will be conducted in accordance with all applicable Federal, State, and local laws and requirements, the Provisions and Assurances, and the schedules attached as indicated above. It is understood by applicant that this application constitutes an offer, and if accepted by Agency or renegotiated to acceptance, will form a binding agreement.

Typed Name and Title of Authorized Official	Telephone Number	Date Signed	Signature
Charlie L. Uselton	817/665-4362	5/25/89	Charlie L Uselton

By May 31, 1989
Return 10 copies of the application with two original signatures to:
Texas Education Agency
Document Control Center
William B. Travis Bldg., Rm. 6-108
1701 N. Congress Avenue
Austin, Texas 78701

00420030-58
TEA DOCUMENT CONTROL NO.

SAS-303R90

Amendment #

TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project
School Year 1989-90

049-901
Co.-Dist.-No.

SCHEDULE #3—Budget Summary

Program Authority: Public Law 98-524, Title II

Line No.	Class/Object Description	Schedule Number	C/Obj. Code	Budgeted Expenditures	
				Federal	Nonfederal
01	Payroll Costs	3B	6100	$ 29,413	$
02	Purchased and Contracted Services	3C	6200	20,580	
03	Supplies and Materials	3D	6300		
04	Other Operating Expenses	3E	6400		
05	Lease Purchase—Construction/Remodeling, Furniture and Equipment	3F	6512		
06	Capital Outlay—Construction/Remodeling	3F	6620		
07	Capital Outlay—Equipment and Furniture	3G	6630		
08	Total Direct Costs (Sum of lines 1-7)			$ 49,993	$
09	Other Uses		699X		
10	Indirect Costs (Not to Exceed 8%)				
11	Total Costs			$ 49,993	$

Amendment # _____

TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project
School Year 1989-90

049-901
County-District No

SCHEDULE #3A—Amended Budget Summary

N/A

Program Authority: Public Law 98-524,Title II

Line No.	Class/Object Code	Federal Previously Approved Budget (A)	Amount Deleted (B)	Amount Added (C)	Federal New Budget (D)	Justifications for Budget Amendments (Please Type) (E)
01	6100	$	$	$	$	
02	6200					
03	6300					
04	6400					
05	6512					
06	6620					
07	6630					
08	Total Direct Costs	$	$	$	$	
09	Other Uses 699X					
10	Indirect Cost (Not to Exceed 8%)					
11	Total Budget Costs	$	$	$	$	

110

Amendment # _____

TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project
School Year 1989-90

049-901
Co-Dist No.

SUPPORT SCHEDULE #3B—Payroll Costs 6100

Line No.	Description of Expense Items	No. of Positions	No. of Days Employed	% of Time Charged to Grant	Total Salary	Fringe Benefits	Total Federal	Total Nonfederal
01	Electronics Instructor - Jack Smith	1	202	100	$ 26,138	$ 3,275	$ 29,413	$
02								
03								
04								
05								
06								
07								
08								
09								
10	Total Costs						$ 29,413	$

120

Amendment # _____

TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project
School Year 1989-90
SUPPORT SCHEDULE #3C—
Purchased and Contracted Services 6200

049-901
County-District No

Line No.	Description of Expense Items	Amounts	
		Federal	Nonfederal
01	6 NIDA Model 130C Test Console	$ 17,730	$
02	6 NIDA CAI AC Circuit Card Set	2,850	
03			
04			
05			
06			
07			
08			
09			
10	TOTAL COST	$ 20,580.	$

SAS-303R90

GENERAL INSTRUCTIONS FOR SCHEDULE #3C - PURCHASED AND CONTRACTED SERVICES

1. Report whole dollar amounts only. Omit decimals. Indicate the amendment number on amendments only.

2. If this application is approved, the applicant shall not use or pay any consultant the conduct of this application if the services to be rendered by such consultant could have been rendered by applicant's employees. Applicant shall, before retaining, contracting with, or incurring any obligation to pay a consultant more tha $200 in any one day or $1,000 in total during the lift of this application, obtain prior written approval from Agency. The applicant should submit Support Schedule #3C.1 - Request for Consultant Services form with this application if the consultant has been selected. If the consultant has not been selected, submit Support Schedule #3C.1 - Request for Consultant Services, along with a Schedule #1 - General Information at a later date, as an amendment.

3. For a consultant receiving less than $200 per day or $1,000 in total, show the fee separate from travel cost in the description area and the total to be paid in the amounts column.

4. Ensure that Line #10, Total Cost, is the same as the amount placed on Line #02 of Schedule #3 - Budget Summary and, for amendments, that the amount is the same as the amount on Line #02, Column (D) of Schedule #3A - Amended Budget Summary.

5. Rental information should include location, approximate square footage, and monthly rate.

6. Rental of equipment should detail rate and number of months.

7. Maintenance and repair of equipment must detail specific items.

Amendment # _____

049-901
County-District No

TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project

School Year 1989-90
SCHEDULE #3C.1—Request for Consultant Services

1. **Consultant:** N/A

   Name _____

2. **Qualifications of Consultant** (including certification if applicable):

3. **Expenses:**

   a. **Fee to Be Paid:** $ _____ per day for a total of _____ days. **Total Fee:** $_____

4. **Work to Be Performed:** _____

SAS-303R90

Amendment # _____

049-901
County-District No

TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project
School Year 1989-90
SUPPORT SCHEDULE #3D—
Supplies and Materials 6300

N/A

Line No.	Description of Expense Items	Amounts	
		Federal	Nonfederal
01		$	$
02			
03			
04			
05			
06			
07			
08			
09			
10	TOTAL COST	$	$

Amendment # _____

049-901
County-District No

TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project

School Year 1989-90
SUPPORT SCHEDULE #3E—
Other Operating Expenses 6400

N/A

Line No.	Description of Expense Items	Amounts	
		Federal	Nonfederal
01		$	$
02			
03			
04			
05			
06			
07			
08			
09			
10	TOTAL COST	$	$

SAS-303R90

Amendment # _____

TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project

049-901
County-District No

School Year 1989-90
SUPPORT SCHEDULE #4—
Program Abstract

Instructions: This abstract form was developed by the Office of Vocational and Adult Education, U.S. Department of Education, to provide detailed information on federally funded projects. It is required for all program improvement projects. Fill in appropriate information for all items except 1, 2, and 9.

Part A—Project Identification

1. Name of State Submitting: Texas

2. Type (Check One)
- [X] Contract — [ ] Contract No. (Specify) _____
- [ ] In-House — [ ] Project No. (Specify) _____

3. Title of Project: 2 Plus 2 Continuation of Electronics Program Development

4. Principal Investigator(s) and Organization(s): Gainesville ISD

Telephone No. (Include Area Code): 817/665-4362

5. Address (Include Number, Street, City, State, and ZIP Code): 1201 Lindsay Gainesville, Texas 76240

6. Organization Type (Check Primary Groups(s))
- [ ] College/University
- [X] Local Education Agency
- [ ] Intermediate Service Agency
- [ ] Indian Tribe
- [ ] Professional Organization
- [ ] Community-Based Organization
- [ ] Individual
- [ ] State Education Agency
- [ ] Small Business
- [ ] Non-Profit
- [ ] Other (Specify) _____

7. Funding Period
Starting Date 7/1/89 Ending Date 6/30/90

8. Source of P.L. 98-524, Title II Funds (Federal Funds Only)
- A. Curriculum Development $ 49,993
- B. Personnel Development $ _____
- C. Other Program Improvement $ _____

9. Charged to Federal Appropriation Year(s)

10. Level of Activity's Impact (Check Primary Level)
- [ ] Adult
- [X] Post Secondary
- [X] Secondary
- [ ] Other (Specify) _____

11. Location
- [ ] Isolated Rural
- [ ] Suburban
- [ ] Inner City
- [ ] Other (Specify) _____

12. Special Population Target Groups (Check Relevant Group(s))
- [ ] Handicapped
- [ ] Disadvantaged
- [ ] Limited English Proficiency
- [ ] Persons in Need of Retraining
- [ ] Persons in Correctional Institutions
- [ ] Single Parents/Displaced Homemakers
- [ ] Persons in Non-Traditional Occupations
- [ ] Displaced Workers
- [ ] Persons in Programs to Eliminate Sex Bias/Stereotyping
- [X] Other (Specify) Secondary - Post Secondary

No further monies or other benefits may be paid out under this program unless this report is completed and filed as required by existing law and regulations.

(over)

Part B--Project Description Abstract

(Fill in the following project description.)

1 OBJECTIVES (Describe the major objectives of this project.)

1. To implement the first year of training as identified in the 1988-89 project entitled "A Model Secondary/Post Secondary 2 + 2 program to prepare students for employment in Electronic Technology.
2. To continue the development/refinement of years 2, 3, and 4 of the 2 + 2 training program which meets the needs of students for employment.

2. PROCEDURES (Describe the processes to be used in implementing and evaluating this project.)

Gainesville ISD, in cooperation with Cooke County College, proposes to implement the first yeat of training in a model 2 + 2 associate degree electronics program. This program will help to satisfy the demand for well-trained specialists at currently operating electronics related industries and two new electronics manufacturing firms presently in Gainesville ISD and Cooke County College's service area.
See attachment B-2 for the processes for implementing and evaluating this project.

3. PRODUCT(S) TO BE DELIVERED (Indicate type, quantity and recipients, R&D outcomes may be a product, a model, a policy finding, or a research result. R&D products are tangible, transportable, self-contained outcomes of the R&D process, source: adapted from "The R&D Exchange: An Emerging Effort," National Institute of Education, 1978.)

1. One (1) finished copy and one (1) camera ready copy of any product developed in the project.
2. Two (2) copies of quarterly progress reports.
3. Five (5) copies of a comprehensive final report of the project.

4. QUALITY CONTROL OF PRODUCT(S) (Describe processes to be used to assure high quality product(s).)

An evaluation committee, consisting of two occupational/technical deans and two secondary curriculum specialists who are responsible for administering electronics or technical programs, will evaluate the program for curriculum quality, appropriateness of classroom and laboratory space and equipment; student access to the program; quality of promotional literature; and degree of involvement of external agencies.
See attachment B-4 for specific evaluation criteria.

Signature of Vocational Education Program Improvement Coordinator, Texas Education Agency	Date

SAS-303R90

Attachment B-2 PROCEDURES

PROCEDURES	PERFORMANCE	TIMELINES
1. Finalize laboratory and classroom equipment	Steering Committee agrees to the appropriateness	July 15, 1989
2. Order equipment	Steering Committee agrees to the appropriateness	July 15, 1989
3. Remodel facilities	Steering Committee agrees	Aug. 15, 1989
4. Disseminate more information concerning 2 + 2 Electronics Program to students and general public	Counselors, administrators, teachers, and general public are made aware of beginning electronics courses to be offered at GISD	Aug. 15, 1989
5. Start courses for DC, AC	Students enrolled will begin classes	Sept. 5, 1989
6. Give a pre-test for students in electronics courses	Counselors and instructors will conduct a pre-test of all enrolled students	Sept. 25, 1989
7. Complete a draft copy of the manual of procedures for development of 2 + 2 programs	The Steering Committee and program personnel evaluate the draft copy for content and accuracy	Jan. 16, 1990
8. Evaluate the first semester courses and develop a plan for improvement of instructional components	Revisions made after consultation with Steering Committee	Feb. 15, 1990
9. Develop a plan for implementation of the second year of the program	Project Staff and GISD administration will submit a plan for the second implementation to the Steering Committee for review	Mar. 1, 1990
10. Implement system to track students who are enrolled in the program	Counselors and instructor will implement a follow-up system	Mar. 15, 1990

Attachment B-2 PROCEDURES

PROCEDURES	PERFORMANCE	TIMELINES
11. Complete final draft of manual of procedures for development of 2 + 2 program	Manual of procedures for development of 2 + 2 programs presented to Steering Committee for final approval prior to submission for printing	April 2, 1990
12. Revise promotional literature developed in the first year of the program for distribution to secondary school students	Promotional literature presented to administrative and counseling staff for review and revisions	May 1, 1990
13. Give a post test for students in electronics courses	Counselors will conduct a post test of all enrolled students	May 15, 1990
14. Implement second year of secondary curriculum plan and enroll students for both years curriculum	Counselors and instructors will make students aware of second year of program curriculum and will enroll students	May 15, 1990
15. Refine a list of instructional and reference materials	Instructor will refine lists and submit to Steering Committee for review	June 1, 1990
16. Evaluate results of first year's experience at both the secondary and post secondary levels	Project staff and representatives from GISD and CCC will make recommendations concerning assessment of students, equipment utilization, instruction, and course sequencing. These will be presented to the Steering Committee for their considerations, and revisions made accordingly.	May 25, 1990
17. Instructional material and manual of procedures for development of 2 + 2 programs prepared for dissemination	Second year report including all instructional materials; manual of procedures; assessment procedures; promotional materials, proofed and finalized for printing and mailed to TEA for distribution to interested agencies.	June 30, 1990

PART B-4: EVALUATION CRITERIA

1. Equipment meets the needs and is comparable to that of the instructional program which is used in industry.

2. A bibliography of related instruction resources needed for program support (books, A.V. materials, etc.) has been updated.

3. Pre-requisite courses are relevant and needed.

4. Courses are properly sequenced.

5. Procedures for student evaluation are included in each course.

6. A student tracking system has been established.

7. Competency profiles for each student are being used.

8. Articulation plans between the local ISD's and post-secondary institutions are in place.

9. Course syllabi are complete.

10. Clearly written program goals and objectives, considering the needs and interests of students have been developed.

11. Student performance objectives are considered in the development of program goals and objectives.

12. Curriculum is relevant to current industry requirements.

13. Written instructional objectives have been developed, and they contain a description of standards or level of performance required of students.

14. Completion of courses provides the student with skills required for entry level employment.

15. Standards for measuring level of performance have been identified and are consistent with instructional objectives.

16. Need for the program has been established through collaborative efforts of the local independent school district, post-secondary institutions, Texas Education Agency and potential employers.

17. The cooperating institutions have committed enough resources to sufficiently develop a model 2 plus 2 electronics program.

18. Evidence exists that suggestions and recommendations of the steering committee have been included in the program development process.

19. Instructional facilities, including both classroom and laboratory space meet the needs of the program.

20. Procedures for program review and modification have been established.

SCALE

High				Low
4	3	2	1	0

Amendment #

TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project
School Year 1989-90
SCHEDULE #4B—Program Description

049-901
County-District No

Narrative/Description of the Program or Component (Use additional copies of this form as necessary.)

Gainesville Independent School District, in cooperation with Cooke County College, proposes to develop the second year of a model 2 + 2 associate degree electronics program. The program will develop an Electronics Manufacturing Technology to help satisfy the demand for well-trained specialists at currently operating electronics related industries and two electronics manufacturing firms in the Cooke County College and Gainesville ISD service area.

Because of the increasingly sophisticated demands on electronic specialists, students must master ever more difficult competencies in mathematics, including calculus, electronics theory, physics, etc. As a result, the underprepared student faces a nearly impossible task of achieving the required competencies in a two-year time frame. The difficulty is well-documented through high attrition figures throughout the community college's electronics programs. As a result, a 2 + 2 integrated curriculum, which gives a student an optimum chance for success, is not only desirable, but may well be crucial if the need for these specialists is to be met.

Discussion initiated by the college administration with Cooke County College Board of Trustees; the chief administrators of the Gainesville ISD; representatives from industrial firms, and the Gainesville area Chamber of Commerce have proven a growing need for electronic specialists in the immediate area. The construction of two electronics manufacturing plants (Texas Instruments just north of Denton and Boeing Electronics just south of Denton) added to the importance of this proposal. A survey conducted by Cooke County College during the previous year of projected manpower and training needs in Cooke, Denton, and Montague counties confirms electronics technology as one of the technical areas offering the greatest prospects for expansion and additional jobs.

A Steering Committee comprised of representatives from the college, Gainesville ISD, business and industry, news media, the local Private Industry Council, the Texas Education Agency and the Coordinating Board will continue to operate. Its task will be to offer assistance in determining job market potential, as well as the kinds of skills mandated for employment in the area's emerging electronics industries and to identify elements for inclusion in the curriculum to be developed. This committee which includes private industry representatives, because of their experience, will be expected to perform a leading role in reviewing the first year of operation and planning for implementation of the second year. The Steering Committee will also review and evaluate each element of the curriculum and the manual of procedures for development of 2 + 2 programs.

There is also recognition of the need for cross-utilization of personnel and facilities at both the high school and community college levels: in short, a removal of artificial barriers to utilize the best teacher at the best facility to give the

Narrative/Description of the Program or Component (Use additional copies of this form as necessary.)

student the greatest chance to achieve required competencies, without regard to his classification. The Steering Committee will also work toward involving industry in the instructional process through the summer hire program, internships, part-time instruction, equipment loan, field trips, and guest lecture appearances. This committee will also be instrumental in developing a tracking system for students entering the program.

Cooke County College expects to hire a full-time program coordinator immediately after approval of this grant. In addition, Gainesville ISD plans to continue employment of an instructor, Jack Smith, to teach three electronic courses and to write curriculum and operational revisions as needed. This staff will continue to implement the 2 + 2 program in a six-year cycle which includes complete implementation of all four years curriculum, together with the necessary follow-up activities.

A student completing two years (secondary portion) of the 2 + 2 program will be employable in the field of electronics in one of the following occupations:

Electric Motor Repairer	Electric Motor Winder
Electric Appliance Repairer	Battery Parts Assembler
Battery Tester	Battery Parts Assembler
Electrical Line Splicer	Electric Tool Repairer

A student completing the 2 + 2 program will be employable in the field of electronics in one of the following occupations:

Electrical Supervisor, Substation
Transformer Assembly Supervisor
Electrical Apprentice, Powerhouse
Corrosion - Control Fitter
Electric-Motor-and-Generator Assembler
Transformer Assembler
Wireworker Supervisor
Power-Transformer Repairer
Voltage Tester
Electric-Meter Installer
Testing-and-Regulating Technician
Supervisor, Electrical Assemblies
Assembler and Wirer, Industrial Equipment
Fabricator, Industrial Furnace
Supervisor, Major Appliance Assembly
Computer Technicians
Numerical Control Maintenance

Amendment # _____

TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project
School Year 1989-90
SCHEDULE #4B—Program Description

049-901
County-District No

Narrative/Description of the Program or Component (Use additional copies of this form as necessary.)

Installation & Modification Technician
Electronic Bench Technicians
Microwave Installation & Maintenance
Automotive Electronics

Records of the planning and development process, along with the activities of the Steering Committee will be made a matter of record. They will be added to the developed curriculum, course syllabi, specified competencies at each course level, and ancillary materials developed through this project. All materials related to the program will be printed, bound, and made available to the Coordinating Board, the Texas Education Agency, secondary institutions, and post-secondary institutions wishing to utilize it as a guide for similar endeavors.

A tracking system to maintain accurate records of students entering, leaving, and completing the program is essential.

A follow-up study as suggested by the RFA will be conducted. All research and/or development activities shall be coordinated with and approved by a steering committee composed of individuals associated with: (1) the occupational area being addressed in the project; (2) secondary vocational education; (3) secondary general education; (4) postsecondary education (minimum of one representing the joint project); and, (5) at least one Texas Education Agency representative approved by the Director of Vocational Education Programs.

All materials shall be appropriate for students in Grades 11-12 and the first two years of postsecondary training, and shall include relevant reading, writing, math, science, computer usage, and general employability skills as well as specific occupational skills. Provisions will be made to meet the needs of handicapped, disadvantaged, and limited English proficient (LEP) students.

Based upon research findings and steering committee approval, the project will:

1. Develop a training program for secondary students in grades 11-12 articulated to first and second year of postsecondary education. The program shall be designed to provide entry-level employment skills after the first two years of training. Advanced employment skills shall be the objective of postsecondary training.

2. Develop a basic course outline for both secondary and postsecondary programs.

3. Develop recommended student prerequisites.

4. Develop a list of curriculum reference materials.

5. Develop a list of necessary tools/equipment to include costs for secondary and postsecondary programs.

TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project
School Year 1989-90
SCHEDULE #4B—Program Description

049-901
County-District No.

Narrative/Description of the Program or Component (Use additional copies of this form as necessary.)

6. Develop a line of a recommended facility to include minimum space and arrangement of equipment.

7. Develop a competency profile for secondary and postsecondary programs.

8. Develop recommended teacher approval criteria. All proposals, materials and/or recommendations will be reviewed and approved jointly by the Texas Education Agency and the Texas Higher Education Coordinating Board.

Amendment # _____

TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project
School Year 1989-90
SCHEDULE #4C—Program Evaluation Design

049-901
County-District No

Evaluation Design (Use additional copies of this form as necessary.)

Evaluation of each aspect of the proposal will take place throughout its development by the Steering Committee. Performance will be measured against goals and timelines included in the operational format of this proposal. A team comprised of occupational/technical administrators who are each responsible for administering electronics programs at their own institutions will conduct the final on-site evaluation. They will evaluate the program for curriculum quality; appropriateness of classrooms, laboratory space and equipment; procedures for access and entry by students; quality of promotional literature; and degree of involvement of external agencies.

SEE PART B-4 FOR ADDITIONAL EVALUATION CRITERIA

TEXAS EDUCATION AGENCY
Standard Application System (SAS)
Vocational Education Program Improvement Project
School Year 1989-90
Schedule #6 - Provisions & Assurances

049-901
Co.-Dist. No.

Statement of Provisions and Assurances for the Program(s) in this application:

A. As used in these Provisions and Assurances,
"Contract" means the entire document, whatever its name or form, of which these Provisions and Assurances and other attachments and schedules, if any, are a part;
"Agency" means the Texas Education Agency;
"Contractor" means the Texas Education Agency;
"Project Administrator" means the person representing Agency or Contractor, as indicated by the contract, for the purposes of administering the contract project;
"Applicant" means the same as "Contractor";
"Application" means the entire package submitted by the Applicant including the schedules included in the application and so indicated on the General Information page of the application package;
"Grant" means the same as "Contract";
"Grantee" means the same as "Contractor";
"Grantor" means the same as "Agency".

B. This contract is executed by Agency subject to the availability of funds appropriated by legislative act for the purposes stated. All amendments and/or extensions or subsequent contracts entered into for the same or continued purposes are executed contingent upon the availability of appropriated funds. Notwithstanding any other provision in this contract or any other document, this contract is void upon appropriated funds becoming unavailable. In addition, this contract may be terminated by Agency at any time upon notice to Contractor. Expenditures and/or activities for which Contractor may claim reimbursement shall not be accrued or claimed subsequent to receipt of such notice from Agency. This contract may be extended or otherwise amended only by formal written amendment properly executed by both Agency and Contractor. No other agreement, written or oral, purporting to alter or amend this contract shall be valid.

The signature on the General Information page indicates acceptance of these assurances.

C. Contractor shall hold Agency harmless from and shall indemnify Agency against any and all claims, demands, and causes of action of whatever kind or nature asserted by any third party and occurring or in any way incident to, arising out of, or in connection with any acts of Contractor, its Agents, Employees, and Subcontractors, done in the conduct of the contract project.

D. Contractor shall not assign or subcontract any of its rights or responsibilities under this contract, except as may be otherwise provided for in this contract, without prior formal written amendment of this contract properly executed by both Agency and Contractor.

E. Notwithstanding any other provision of this contract, Contractor shall not use or pay any consultant in the conduct of this contract project if the services to be rendered by any such consultant can be provided by Contractor's employees. Contractor shall, before retaining, contracting with, or incurring any obligation to pay any consultant to be paid more than $200 in any one day or $1,000 in total during the contract project, identify each such consultant in writing to Agency by name, qualifications, need for and proposed use of such consultant's services; and Contractor shall not, except as may be otherwise provided for in this contract, retain, contract with or incur any obligation to pay any such consultant without the prior written approval of the Commissioner of Education of Agency or his designee.

F. All encumbrances, accounts payable and expenditures shall occur on or between the beginning and ending dates of this contract. All goods must have been received and all services rendered during the contract period in order for the contractor to recover funds due. In no manner shall encumbrances be considered or reflected as accounts payable or as expenditures.

The signature on the General Information page indicates acceptance of these assurances.

G. Contractor shall maintain its records and accounts in a manner which shall assure a full accounting for all funds received and expended by Contractor in connection with the contract project. These records and accounts shall be retained by Contractor and made available for audit, by Agency and by others authorized by law or regulation to make such an audit, for a period of not less than seven (7) years from the latter of the date of completion of the contract project or the date of the receipt by Agency of Contractor's final claim for payment or final expenditure report in connection with this contract or if an audit has been announced the records shall be retained until such audit has been completed.

H. All materials, conceptions and products produced or conceived by Contractor, its employees, agents, consultants or subcontractors, arising out of the contract project shall be the sole property of Agency, and Agency shall have the exclusive right to copyright and patent these materials, conceptions and products, subject to applicable law. Contractor shall so bind all concerned.

I. If Contractor, in Agency's sole determination, fails or refuses for any reason to perform any of its obligations under this contract, Agency may impose such actions as it may deem appropriate, including but not limited to the withholding of payments to Contractor until Contractor complies, the cancellation, termination or suspension of this contract in whole or in part, and the seeking of other remedies as may be provided by this contract or by law. Any cancellation, termination or suspension of this contract, if imposed, shall become effective at the close of business on the day of Contractor's receipt of written notice thereof from Agency.

J. If this contract is canceled, terminated or suspended by Agency prior to its expiration date, the monetary value of services properly performed by Contractor pursuant to this contract shall be determined by Agency and paid to Contractor as soon as reasonably possible.

The signature on the General Information page indicates acceptance of these assurances.

K. If Agency determines that Agency is due a refund of money paid to Contractor pursuant to this contract, Contractor shall pay the money due to Agency within 30 days of Contractor's receipt of written notice that such money is due to Agency. If Contractor fails to make timely payment, Agency may obtain such money from Contractor by any means permitted by law, including but not limited to offset, counterclaim, cancellation, termination, suspension, total withholding and/or disapproval of all or any subsequent applications for said funds.

L. In the event of loss, damage or destruction of any property owned by or loaned by Agency while in the custody or control of Contractor, its employees, agents, consultants or subcontractors, whether the property is developed or purchased by Contractor pursuant to this contract or is provided by Agency to Contractor for use in the contract project, Contractor shall indemnify Agency and pay to Agency the full value of or the full cost of repair or replacement of such property, whichever is the greater, within 30 days of Contractor's receipt of written notice of Agency's determination of the amount due. If Contractor fails to make timely payment, Agency may obtain such money from Contractor by any means permitted by law, including but not limited to offset or counterclaim against any money otherwise due to Contractor by Agency.

M. In the conduct of the contract project, Contractor shall be subject to Texas State Board of Education rules pertaining to this contract and the contract project, and to the laws of the State of Texas governing this contract and the contract project. This contract constitutes the entire agreement between Agency and Contractor for the accomplishment of the contract project. This contract shall be interpreted according to the laws of the State of Texas except as may be otherwise provided for in this contract.

The signature on the General Information page indicates acceptance of these assurances.

N. If this contract project is federally funded, Contractor shall be subject to and shall abide by all Federal laws, rules and regulations pertaining to the contract project, including but not limited to Title VI of the Civil Rights Act of 1964, as amended (prohibition of discrimination by race, color, or national origin), and the regulations effectuating its provisions contained in Part 100 of Title 34, Code of Federal Regulations; Title IX of the Education Amendments of 1972, as amended (prohibition of sex discrimination in educational institutions) and the regulations effectuating its provisions contained in Part 106 of Title 34, Code of Federal Regulations, if Contractor is an educational institution; Section 504 of the Rehabilitation Act of 1973, as amended (nondiscrimination on the basis of handicapping condition), and the regulations effectuating its provisions contained in Part 104 of Title 34, Code of Federal Regulations; the Age Discrimination Act of 1975, as amended (prohibition of discrimination on basis of age), and any regulations issued thereunder; and the Family Educational Rights and Privacy Act of 1975, as amended, and any regulations issued thereunder, if Contractor is an educational institution. Contractor shall timely make and file with the proper authorities all forms, assurances and reports required by the foregoing laws and regulations. Agency shall be responsible for reporting to the proper authorities any failure by Contractor to comply with the foregoing laws and regulations coming to Agency's attention, and may deny payment or recover payments made by Agency to Contractor in the event of Contractor's failure so to comply.

O. The Contractor's proposal, furnished to Agency in response to a request for proposal published in the Texas Register, or otherwise furnished by Contractor, is incorporated in this contract by reference for all necessary purposes. It is specifically provided, however, that the provisions of this contract shall prevail in all cases of conflict arising from the terms of Contractor's proposal whether such proposal is a written part of this contract or is attached as a separate document.

The signature on the General Information page indicates acceptance of these assurances.

Statement of Specific Provisions and Assurances for PL 98-524:

A. Applications for vocational program improvement projects shall include a statement of how the project will benefit handicapped individuals, disadvantaged individuals, and individuals with limited English proficiency.

B. Applications shall give assurances that any project assisted with funds made available under this part shall be of sufficient size, scope, and quality to give reasonable promise of meeting the vocational education needs of the students involved in the project.

C. Applications shall show evidence of how the proposed project will contribute to the improvement, innovation, and expansion of vocational education rather than to maintenance of existing programs.

D. Curriculum Development Applications shall address the practical applications of math and science and shall reinforce basic skills of reading, writing, science, social studies, and mathematics within the vocational curriculum.

E. Personnel Development Applications shall give evidence of how the project will increase the competence of vocational teachers, counselors, and administrators, including special emphasis on the integration of handicapped and disadvantaged students in regular courses of vocational education.

F. Personnel Development Applications shall make provision for the issuance of advanced academic training credit for the career ladder as appropriate, in accordance with 19 TAC 149.81.

G. Any personnel changes occurring within the project period require prior written approval by the Texas Education Agency.

H. Any publication resulting from a contract through this application will display the Compliance Statement shown on page ii of this application.

The signature on the General Information page indicates acceptance of these assurances.

I. Amendments to this contract will be in a manner as prescribed in the Standard Application System, Vocational Education Program Improvement Project. All requests to amend this contract must be received by the Document Control Center, Texas Education Agency, on or before June 15, 1990.

J. An initial payment will be made in an amount determined by the Agency. Subsequent payments will be based on expenditure reports submitted on Form SAS-313 and Form SAS-319 if the Contractor is other than a school district or an education service center. The Contractor may elect to submit only one expenditure report for the entire contract period. The due date of the final expenditure report will be 45 days following the end of the contract period. Payment on the final expenditure report is contingent upon receipt of all reports and deliverables required by this contract.

K. As a condition of the receipt of federal funds authorized under PL 98-524, the Contractor must arrange for a single financial and compliance audit in accordance with the Single Audit Act of 1984, PL 98-502, or OMB Circular A-110, "Uniform Requirements for Grants to Universities, Hospitals and Other Non-Profit Organizations."

L. The applicant shall insure that federal funds shall be used to supplement, not supplant, nonfederal funds and in no case replace nonfederal funds that would have, in the absence of federal funds, been used to fund vocational programs.

M. The applicant agrees to maintain documentation in support of the assurances and other information provided in this application and, upon request, make such documentation available to the Texas Education Agency.

The signature on the General Information page indicates acceptance of these assurances.

MINUTES
STEERING AND ARTICULATION COMMITTEE MEETING
2 + 2 ELECTRONICS PROJECT
GAINESVILLE HIGH SCHOOL AND COOKE COUNTY COLLEGE

February 22, 1989

The Steering and Articulation Committee members met for the first time to begin developing plans for implementation of an Articulated Model 2+2 Electronics program between Gainesville High School and Cooke County College. The meeting was held in the Faculty Lounge of Cooke County College.

MEMBERS PRESENT: Dr. Luther Bud Joyner, Mr. Charles Uselton, Mr. Joe Shults, Mr. Jack Smith, Mr. Whitten Williams, Mr. Tom Loftin, Dr. Therril Valentine, Dr. Kenneth Washburn, Dr. Doug Keenan, Ms. Margaret Duncan, Dr. Dale Alsup, Mr. Clyde Yeatts, Mr. Jim Fletcher, Ms. Patty Gilbert, Ms. Greta Miller, Mr. Frank Fuller, Mr. Bill McCarley, Mr. Mike Martin, Ms. Jo Anne Smith, Mr. George Pavelek, Mr. Barry Payne, and Mr. Jim Calhoun.

MEMBERS ABSENT: Mr. Thomas J. Risinger, Mr. Eduardo Gaytan, Mr. Carl Smith, Mr. Terry Tuck, and Mr. Glenn Stockard.

I. WELCOME

Dr. Bud Joyner, President of Cooke County College, and Mr. Charles Uselton, Superintendent of Gainesville Independent School District welcomed the members. All members were introduced and dinner served. After dinner, Joe Shults briefed the committee on the 2 + 2 Project. Handouts about the project and other material were given to each member in the form of a packet.

II. SELECTION OF A CHAIRMAN

Mr. Shults explained that a chairperson needed to be chosen and agreed upon by the committees. A motion was made by Frank Fuller for Mr. Shults to be the chairman of both the Steering and the Articulation Committees. The motion was seconded by Jim Fletcher and the motion carried.

III. DISCUSSION OF 2+2 CONCEPT

Whit Williams said he and other administrators are convinced a 2+2 program can be successful.

Dr. Ken Washburn expressed concern for the student who did not go to Gainesville High School but wants to take the electronics program at CCC.

It was explained by Mr. Shults that this would be possible because everything offered at the high school would also be offered at the college for students who come from high schools where electronics is not offered. If a prospective student has had electronics previously, that person would be given the opportunity to test out of the class commensurate with the student's competency. He/she can then go to the next class in the sequence.

Dr. Washburn asked if there would be two programs, one each at the high school and college, or would there be only one facility for both.

Mr. Williams explained the 2+2 concept and that offerings would be at both the high school and the college so as to be able to cover all possibilities.

BEST COPY AVAILABLE

Dr. Joyner explained that several high schools in the CCC service area would possibly be interested i becoming involved in the 2+2 concept. The project is currently being funded for GISD and CCC, but t concept can be expanded to other ISD's within a college service area.

IV. COMMENTS FROM PEOPLE OF INDUSTRY

Mr. Williams asked the industry representatives to present their feelings on the 2+2 project a concept.

Terry Tuck said he was impressed with the breadth and depth of the offerings of the 2+2 program.

George Pavelek said competency based curriculum will help marketability of students and will prov graduates of this program a better opportunity to articulate their strengths in a language an employer understand.

Barry Payne said some of his employees have expressed an interest in electronics and this type program would be good for any industry.

Mr. Williams suggested a person may be interested in pursuing a four-year degree plan after his tim CCC, and that he could . This is 2+2+2.

Mr. Pavelek said 2+2 downward should be considered. Starting early in high school or in mid school in getting people interested in the "world of work" could be beneficial. When people find out what they are doing is not what they want, they may retrain. This is expensive. Challenge business a industry to open their doors to young people for field trips so they can see what goes on in the "worlc work". This could help them make up their minds as to what they want to do.

V. NEED FOR SUCH A PROGRAM

It was explained by the chairman that a need for a program in electronics with the 2+2 concept sh be determined. It was agreed that a need for this type of program and this type of concept has a need the CCC service area based on knowledge of the business and industry representatives present based on the employment survey conducted within Montague, Cooke, and Denton Counties.

An additional survey conducted by Mr. Shults stated that a nation-wide survey he prepared conducted for Northern Montana College clearly indicated that there is a need for an associate de electronic technician on a nationwide basis.

Mr. Shults also added that an associate degree is the beginning of a professional career and as s graduates may find it necessary to relocate.

Mr. Shults suggested we make our commitment to formalize and establish a need for the electr program and the 2+2 concept.

Dr. Joyner asked the chairman which of the four proposed degree plans within the packet dic project staff support the strongest.

Dr. Therril Valentine suggested a calculus course be included in the proposed Electrc Engineering Technology program. The chairman explained that the proposed programs were ope modification by committee members as deemed appropriate.

Mr. Pavelek suggested a look at engineering schools to see what they do and modify one of the proposals for a 2+2+2 concept to be able to maximize the program for the student who wants to go on to the four-year school.

Mr. Fuller suggested a full year of calculus would not be too far out of line for this type of program.

Mr. Tuck said calculus itself may be too much for this type of program. Instead, have a survey course with different aspects of math.

Mr. Shults suggested Electronics Technology and Electronics Engineering Technology be adopted by the committee with further emphasis on Manufacturing Technology and Electro-Mechanical Technology at a later time.

Mr. Payne made a motion to adopt Electronics Technology and Electronics Engineering Technology now, and consider Manufacturing Technology and Electro-Mechanical Technology at a later time. Motion was seconded by several. The motion carried.

VI. AT RISK STUDENTS IN 2 + 2

Dr. Washburn asked about dropout students.

Mr. Shults explained that 75% of high school students know they are not on a college academic track and are going to get very little value from high school. Perhaps this program can help.

Dr. Joyner stated: "If we have low expectations we can expect low expectations. However, with higher expectations the program will work." Dr. Joyner then asked for input from counselors.

Greta Miller said there are eighth graders that would be interested in a program such as this.

Margaret Duncan said high school students are not motivated for a program like this. They have no need or drive. Also, they lack the math background leading to high attrition.

Mr. Williams said it would be beneficial to inform students as far back as the seventh grade that program exists for them in high school. To prepare for it, they need to take math and science courses between now and their entry time into high school.

Mr. Pavelek said students will look for reasons to stay in school, and to stay with a program that they know will eventually satisfy their expectations.

Mrs. Duncan said that students presently identified as "at-risk" would not go into this program at this time, but as times change, these students may change also.

Mr. Shults said this program is a good program and believes it will be good for students. "At-risk" students are not necessarily failures; they are not motivated. This program will help that type of "at-risk" student.

Mrs. Duncan reiterated support for the program, and that there is a place for the program in the high school, but the "at-risk" students need to be examined.

Dr. Joyner concurred with Mrs. Duncan's concern for the "at-risk" student. There may be programs that are more suitable to an "at-risk" student. If first year attrition could be identified as suggested by Dr. Valentine, then this concept could be transferable to other programs.

BEST COPY AVAILABLE

Mrs. Duncan said, even if a high school student did not elect to go to college, these 2+2 program courses could satisfy the electives for high school graduation and at the same time satisfy their curiosity.

Mr. Shults added that the students Mrs. Duncan alluded to would be more employable for having taken the 2+2 program courses in high school if he/she chooses not to continue at college.

Tom Loftin pointed out that there are two different definitions for "at-risk": (1) a high-achiever, good student who fails somewhere along the line, and (2) the student who has failed all along the way through high school. The grant to support this program is aimed at the better student who chooses not to go to college.

Mr. Williams said that junior college is a good investment economically for local high school graduates.

Dr. Joyner pointed out that these programs cannot be approved as transfer curriculum. They must be technical courses. We are not permitted to allow this type of program to be on a parallel with a university program.

VII. CLOSURE

Mr. Shults explained that two gentlemen, one from Texas Education Agency and another from the Texas Coordinating Board were unable to attend the meeting. Also, there are some administrative requirements dictated by law that the project staff needs to work out. However, input on the content of the curriculum is what the committee should work on.

A copy of the curriculum survey was discussed for course competency requirements. A date was set for return of the survey for March 1. A second committee meeting was set for 7:00 PM, Wednesday March 8th. The dates were set arbitrarily for completion, incorporation, and development of curriculum. Should anyone care to make necessary changes, time could be allowed up to the time we submit the final version of this project to the Coordinating Board and TEA.

Mr. Shults thanked each individual for attending and that the project staff would work diligently to incorporate any suggestions.

The meeting was adjourned.

MINUTES
STEERING AND ARTICULATION COMMITTEE MEETING
2 + 2 ELECTRONICS PROJECT
GAINESVILLE HIGH SCHOOL AND COOKE COUNTY COLLEGE

March 29, 1989

The Steering and Articulation Committee members met March 29, 1989 to continue development plans for implementation of an Articulated Model 2 + 2 Electronics program between Gainesville High School and Cooke County College. The meeting site was the Gainesville High School Cafeteria and Library.

MEMBERS PRESENT: Dr. Luther Bud Joyner, Mr. Charles Usellon, Mr. Joe Shults, Mr. Jack Smith, Mr. Whitten Williams, Mr. Tom Loftin, Mr. Thomas Risinger, Mr. Eduardo Gaytan, Dr. Therril Valentine, Dr. Kenneth Washburn, Dr. Doug Keenan, Ms. Margaret Duncan, Dr. Dale Alsup, Mr. Clyde Yeatts, Ms. Patty Gilbert, Ms. Greta Miller, Mr. Frank Fuller, Mr. Bill McCarley and Mr. Glenn Stockard.

MEMBERS ABSENT: Mr. Jim Fletcher, Mr. Carl Smith, Mr. Mike Martin, Ms. Jo Anne Smith, Mr. Terry Tucker, Mr. George Pavelek, Mr. Barry Payne and Mr. Jim Calhoun.

I. WELCOME AND MINUTES

Mr. Joe Shults welcomed the members and dinner was served. After dinner members were asked to review the information packets and examine the minutes from the last meeting. The minutes were read and approved as read.

II. INTRODUCTIONS

Mr. Whitten Williams introduced Mr. Eduardo Gaytan, Representative of the Texas Coordinating Board of Austin, Texas. Mr. Tom Loftin introduced Dr. Thomas Risinger, Representative of the Texas Education Agency in Austin, Texas. Mr. Shults introduced Mr. Glenn Stockard, Representative of Tetra Pak of Denton. All are members of the Steering Committee.

III. COMMITTEE ASSIGNMENTS

Committee assignments were discussed and individual committees were instructed where to meet for the business meeting. The joint business meeting was adjourned.

MINUTES
ARTICULATION COMMITTEE MEETING
2 + 2 ELECTRONICS PROJECT
GAINESVILLE HIGH SCHOOL AND COOKE COUNTY COLLEGE

March 29, 1989

The Articulation Committee met in the Gainesville High School Library.

MEMBERS PRESENT: Dr. Luther Bud Joyner, Mr. Jack Smith, Ms. Margaret Duncan, Ms. Patty Gilbert, Mr. Frank Fuller, Ms. Greta Miller, Mr. Clyde Yeatts, Mr. Bill McCarley, Mr. Tom Loftin and Dr. Thomas Risinger.

I. STAFF ACTIVITIES

Mr. Jack Smith stressed the importance of the committee and its input. An updated report of activities was given, noting the competency list has been compiled from the survey of the Educational and Industrial Board members. A good representation enabled staff to produce the competence list requirements of skills applicable to the Associate of Applied Science Degree in Electronics Engineering and Electronic Technology.

II. PROGRAM EVALUATION

The proposed list of courses EL 1103, DC Circuit Analysis; EL 1203, AC Circuit Analysis; and EL 1303, Solid State Electronics, plan to be offered at High School. The remainder of the list is courses to be offered at the college. The same competencies will be met at both the High School and Cooke County College. There should be no problem with these three courses being articulated. Students should have a pre-algebra background. In comparison of the two proposed plans, Electronics Technology and Electronics Engineering Technology, the twelve Electronics courses are the same. The difference is in the existing general education courses.

III. INSTRUCTIONAL RESOURCES

Instructional Resources refers to the Technical Math. (Programmed Math book) Mr. Smith asked if students can keep the book and write in it. Mr. Bill McCarley said it would be possible if the school bought the books. Margaret Duncan asked if there were funds to buy consumable books. Mr. McCarley said there would be after the first year. It would depend on how many high schools are offering this course under Chapter 75. Mr. Frank Fuller discussed Chapter 75 but didn't think it would be referring to the same Tech Math.

Dr. Joyner discussed dual credit. With High School certifying essential elements, the college can offer the same course. Students can receive dual credit and certify as a college course with concurrent enrollment. Mr. Jack Smith recommended Technical Algebra and Technical Trigonometry for dual credit for 3 or 6 hours. Clyde Yeatts and Patty Gilbert said these courses could not be covered by one semester. Minimum of 10th grade entry level would be required. Frank Fuller said this would replace Algebra I. Mr. McCarley said students with only pre-algebra might have a difficult time through the course.

IV. SUB COMMITTEE TO IDENTIFY EQUIPMENT AND FACILITIES

Mr. Smith said Lab-Volt (vendor) will be in Gainesville at the Holiday Inn on April 11th at 9:30 AM. Basic costs will be offered at this meeting. Three other vendors are also wanting to share competitive prices. Mr. Smith and Mr. Shults are going to ask a sub-committee to visit various facilities to observe upgraded electronics programs. Possibly videos could be made and shown at a future meeting.

V. STOP OUT OPTIONS FOR STUDENTS

Dr. Joyner said when students reach the sophomore level with only the need for 6 to 9 courses to complete the program, employers are offering opportunities for employment for these students. Some night courses will probably be a must. Mr. Fuller asked if this is a recognizable vocational sequence program, that distinguishes between a 2 + 2 and an Articulated program? Mr. Smith discussed some exit level stop out options and job qualifications students can meet. Tom Loftin said some students could qualify for some occupations and distributed a list describing employable options. Dr. Joyner said Stop Out Certificates for college level can be used.

Mr. Loftin said College Trig and College Algebra would be equivalent to Honors Algebra II and College Trig the same as Honors Trig. Mr. Smith gave the Tech Math books to Mr. Yeatts to review.

Mr. Fuller defined 2 + 2 and Articulation agreements and noted articulation agreements are not dual credit.

VI. TASP TEST

TASP test has to be taken before any student can enroll for dual credit.

VII. OFFICIAL DEGREE PLAN

Mr. Smith said the student must initiate an official degree plan with a counselor at the college. It was also suggested that it would be a good idea to initiate it in High School.

VIII. PROGRAM PERSONNEL MEETING

Personnel will have a meeting at least once a semester.

IX. TRACKING SYSTEM

Dr. Joyner discussed Operation Lone Star. It's a tracking system for a five year time period after the student has graduated.

X. ADJOURNMENT

Mr. Smith said members will be notified of the next meeting date by mail. The meeting was adjourned.

MINUTES
STEERING COMMITTEE MEETING
2 + 2 ELECTRONICS PROJECT
GAINESVILLE HIGH SCHOOL AND COOKE COUNTY COLLEGE

March 29, 1989

MEMBERS PRESENT: Mr. Joe Shults, Mr. Tom Loftin, Mr. Whit Williams, Dr. Therni Valentine, Dr. Doug Keenan, Dr. Kenneth Washburn, Dr. Dale Alsup, Mr. Thomas Risinger, Mr. Glenn Stockard, Mr. Charles Uselton and Mr. Eduardo Gaytan.

I. SURVEY RESULTS

Mr. Joe Shults reported that the results of the survey were impressive although he didn't agree totally with all competencies listed however, he doubted if anyone participating would do otherwise. The competencies have been grouped by the proposed course within the two degree plans. One requirement of the grant being to produce a document of a list of the competencies for the programs. This also serves a secondary purpose of providing a rating scale for each of those competencies. A competency profile is required for the High School System and gives a good identity as to what's taking place with students and helps track and document the fact that the student completed competencies and at what level. The list of competencies and grouping were approved by the committee.

II. ENGINEERING TECHNOLOGY

Mr. Shults reported changes in the 3 digit prefix of EET to a 2 digit prefix of EL to accommodate the CCC Catalog, also some titles and course descriptions were changed. We did include transducers as far as instrumentation.

III. CALCULUS

The floor was opened for discussion of the addition or omission of calculus. After a lengthy discussion by all parties, it was agreed that calculus is a necessity. Introduction to Computers should be dropped because most, if not all, entering the Engineering Technology will have taken a computer literacy course. The stated reason for including the course was that it was a pre-requisite listed in the catalog for CS 1124, Computer Programming-Pascal, which is a desirable course for the program. The consensus of the committee was that the catalog needed updating. The removal of CS 1104, Introduction to Computers, would drop the total Electronics Engineering Technology to 72 semester hours, a desired level. Both degree plans were approved as amended.

IV. EQUIPMENT AND FACILITIES

Joe Shults reported the need to meet with vendors to identify equipment and facilities requiring approximately 4 to 6 hours. This is currently set for Tuesday, April 11th, at 9:30 AM at the Holiday Inn in Gainesville. Mr. Shults proposed to renovate the 200 building and showed a general layout of the electronics portion. He suggested tables, work areas, and transportable equipment to present a professional atmosphere. He then asked for volunteers to serve on this committee to view and recommend equipment and facilities, the first meeting being at the Holiday Inn, April 11th, at 9:30 AM.

V. CLOSURE

Mr. Shults announced his acceptance of two invitations to speak on the 2 + 2 Project. The first being on April 8th, in Oklahoma the second being on April 11th at the Gainesville Kiwanis Meeting in Ganesville, Texas. The business meeting was adjourned.

MINUTES
ARTICULATION COMMITTEE MEETING
2 + 2 ELECTRONICS PROJECT
GAINESVILLE HIGH SCHOOL AND COOKE COUNTY COLLEGE

MAY 3. 1989

The Articulation Committee members met May 3. 1989 to continuedevelopment plans for implementation of an Articulated Model2 + 2 Electronics program between Gainesville High Schooland Cooke County College. The meeting site was Gainesville High School Cafetena and Library.

MEMBERS PRESENT: Mr. Whit Williams, Mr. Charles Uselton, Mr. Joe Shults, Mr. Jack Smith, Mr. Tom Loftin, Mrs. Margaret Duncan, Mr. Clyde Yeatts, Ms. Greta Miller, Mr. Mike Martin, Mr. Bill McCarley, Ms. Jo Anne Smith, Mr.George Pavelek.

MEMBERS ABSENT: Dr. Luther Bud Joyner, Mr. Thomas J. Risinger, Mr. Eduardo Gaytan, Dr. Dale Alsup, Ms. Patty Gilbert, Mr. Frank Fuller.

I. WELCOME AND MINUTES

Dinner was served in the cafetena at 7:00 pm. Mr. Joe Shults welcomed members and informed them of packets containing minutes from the last meeting of March 29, 1989, the Draft of Student Assessment, Student Survey Request, Articulation Agreement, and Position Vacancy Notice. The minutes were read and approved as read.

II. STAFF ACTIVITIES

Mr. Shults informed members of the Position Vacancy Notice for the Instructor of Electronics. He also informed members of the survey being conducted by Cooke County College to the public thru local newspapers to document interest in the electronics program. He requested members to take additional copies and distribute them. Mr. Whit Williams stressed the need for the documentation for the Texas Coordinating Board. Mr. Charles Uselton asked if there had been a good reply. Mr. Shults said there was a good sampling but there was a need for more documentation. He also informed members of two local industries showing interest, Unimax and Andrews Corp. for their employees.

Mr. Shults informed members that much of the final document is now completed or near completion. Four individuals specified in the grant are due May 22 thru May 26 to evaluate the program. These individuals are administrators who are administrating technical vocational programs at divisional levels within the state. Three of these members have been involved with articulation programs in other schools.

III. INDUSTRY SUPPORT

Mr. Shults informed members of a need for letters of support from industries in this region. Any help from committee members would be appreciated in providing these letters of support by May 15. 1989.

IV. STUDENT ASSESSMENT

Mr. Shults informed members of the Student Assessment Draft in their packet compiled by Dr. Jerry Moorman of the University of North Texas. Dr. Moorman's recommendation was the MESA System. If this instrument is not possible to secure, an acceptable substitute would be the GATB. The MESA is a criteria based tool and identifies individuals who have the aptitude for the program.

Mr. Williams informed Mr. Shults and committee members the purchase of the MESA System is already in process and should be completed by the end of the summer.

V. DISCUSSION OF PROPOSED ARTICULATION AGREEMENT

Mr. Shults read through the contents of the Articulation Agreement with committee members. Special emphasis was placed on Articulated Credit and Concurrent Credit the difference being, Concurrent Credit requires no tuition or fees with post-secondary credit being held in escrow until the participating student has completed 12 semester hours at CCC. Articulated Credit does require tuition and fees payment to CCC. The student has two options, one requires payment as the credit is earned and the other requires the credit be held in escrow until the student has completed high school and payments have been made. Under both options the credit will be available for transfer immediately after payment of applicable tuition and fees to CCC.

Mr. Shults then discussed the Articles of Agreement between Cooke County College (CCC) and Gainesville High School (GHS) with the committee members. Then the discussion went on to the subject of how the student earns credit and when and if a student has to pay for it and under what circumstances the student has to pay.

The precedence has been set at Leander High School and Austin Community College. Mr. Charles Rouse, Principal of Leander High School came to Cooke County College on April 21, 1989 and met with governing bodies and essential personnel of CCC and GHS. Mr. Rouse informed members that Leander High School students' credits were held in escrow until the students had completed the prescribed number of hours at Austin Community College. Those hours were then transferred to the college and became an official part of the student record.

Mr. Shults explained to members that Dr. Luther Bud Joyner has asked Dr. Eddie Hadlock to contact the Registrar at Austin Community College and Leander High School to inquire as to how funding arrangements were made.

Mr. Williams felt that if a student has taken a course in high school being equivalent to the college course, its wrong to hold the credit until its paid for when in essence it was paid for in high school by the taxpayers.

Mr. George Pavelek also agreed that the student should not be penalized; this being the purpose of the Articulation Agreement.

Mr. Uselton asked about items 4 and 5, students paying fees at CCC. Mr. Shults explained the difference between the two items of Concurrent Credit and Articulated Credit.

4. Students will not be charged tuition or fees for *articulated credit* earned under this agreement. After successfully completing six hours and at the student's request, the transferred articulated credit will be recorded on CCC's official records..

5. Students enrolling for *concurrent credit* must meet all provisions of CCC's Early Admissions program, and must pay applicable tuition and fees at registration.

Mr. Shults said these two agreements gives students the opportunity to accumulate valid college credit for valid college courses.

Mr. Loftin asked, "Why is credit held in escrow?"

Mr. Shults explained this is the only vehicle available for holding.

Mr. Loftin expressed personal reservations concerning credit in escrow. There was a lengthy floor discussion on concurrent and articulated credit by committee members. He also asked if Item 16," credit earned at GHS under this agreement is valid and transferrable to CCC for a period of five years from the date of a student graduation from GHS", is a state requirement?

Mr. Williams explained the thinking behind the five years. If a student takes the courses and then lays out of school five years, the chances are the student will not retain the skills and knowledge to go on in the program

VI. APPROVED ARTICULATED/CONCURRENT CREDIT COURSES

Mr. Loftin asked if College English was left off on purpose on item B page 7.

Mrs. Duncan explained to committee members that if College English is offered, the student should have the opportunity to have articulated credit or concurrent credit. Mr. McCarley agreed.

Mr. Loftin reminded members that in the previous meeting the discussion was to have College Algebra and College English for two semesters and College Trig.

Mr. Shults agreed that College English (1043 &1053) should be included in the list of approved credit courses.

Ms. Greta Miller inquired about technical writing.

Mr. Shults said Technical Writing is included in the Electronics Engineering Degree plan but not in the Electronics Technology plan.

Mr. Pavelek stated that six hours of english is required before Technical Writing can be taken.

Mr. Loftin asked why Economics was not a part of the program. Mr. McCarley said Economics can still be taken under dual credit.

Mr. McCarley said Economics can still be taken under dual credit.

Mr. Shults stressed the fact of 72 hours limit for the Associate of Applied Science degree plan.

Mr. Williams reminded members to avoid the continued addition of hours of technical courses to the degree plan until it becomes more than a 2 year plan. The state is more likely to approve a 66 hour degree plan.

Mr. Loftin asked for an opinion from the other secondary administrators if they could accept this articulation agreeement.

Ms. Jo Anne Smith said, "I think so."

Ms. Greta Miller also agreed.

Mr. Loftin said we are developing a model program for the state and it is imperative that we assure the ability of other administrations to model after this program.

Mr. Williams agreed on the importance of the model program being usable by other districts.

Ms. Smith asked if Leander High School wasn't the model for the state.

Mr. Williams said no, that Leander is just giving high school graduates who go to Austin Community College and take 12 hours, credit for 12 hours from their high school experience. This small amount of pioneering has recieved a multitude of interest.

Ms. Smith questioned the fact that the students at Leander High School are not paying for the 12 hours at high school.

Mr. Williams confirmed this.

Ms. Smith then said it was her understanding that the articulation agreements that Lewisville ISD has with Dallas Community College and TSTI in Waco is simply not repeating something you had in high school, therefore not paying for it. This being the reason the legislature mandated articulation.

Mr. Williams said another purpose is to assure a continuing quality program beginning at an earlier age so career objectives could be met without floundering around.

VII. ELIGIBILITY

Ms. Duncan asked when and how they would go about administering the assessment test.

Mr. Shults explained this is administrative in nature and would depend on if Cooke County College made purchase of the MESA test. The exact date has not been scheduled but needs to be done in ample time to determine the cut-off time in enrollement.

Mr. Williams stressed that the test would be an administrative matter.

Mr. McCarley said at this point testing would be either now or after the fact.

Mr. Williams said in this case, we will be testing after the fact, but that does not mean the test will continue in this manner.

Mr. Loftin asked about Item B Page 8, Eligibility in regards to grade level 10 or above which may be a problem with certain courses because some courses cannot be taught in the 10th grade.

Mr. Shults explained that alot of effort was made in developing the degree plan with the assumption that Tech Algebra would be taught before DC and Tech Trigonometry before AC. " You're doing the students a diservice if you don't."

Mr. Loftin agreed but stressed the Agency would not overlook the fact that technical courses can not be taught before the 11th grade.

Ms. Duncan asked if these students could be labeled "at risk".

Mr. Loftin expressed concern about specifying grade levels for these courses in question.

Mr. Pavelek suggested putting those perimeters on those two courses only.

Mr. Loftin said when this is submitted to the agency it needs to fall within the master plan of vocational education and needs to specify that some courses will be 11th grade entry level only.

Mr. Williams said that there may be some dispensation with this being a model program.

Mr. Loftin said it wouldn't be after its open to the general public.

Ms. Smith made the suggestion to asterisk the courses to be taken in the 10th grade with others to be taken in the 11th grade.

Mr. Loftin said with those changes made the articulation could be approved. He then made the motion to accept the Articulation Agreement.

Mr. McCarley seconded the motion and all committee members approved.

VIII.CLOSURE

Mr. Shults informed members that the 2 + 2 Project goes before the Cooke County Board of Trustees Monday, May 15th. He also informed members of $115,000. available for the renovation of the 200 building at Cooke County College.

Three consultants will be coming in to formulate and look at proposals on Facilities and Equipment in addition to the sub-committee.

Mr. Pavelek explained to committee members how the industries use this type of program in terms of equipment and facilities. The requirements being to have:

1. a quality program
2. quality equipment to attract the student
3. a laboratory setting to show organizations that may be interested in your graduates

He stressed that these considerations be kept in mind in making these decsions. He also suggested considering areas for computer simulation of lab work that might in the long run save your hardware cost and give lab equipment that could be multi-disciplined.

Mr. Shults informed members of the impressive vendor presentation held on Friday, April 28th. Also there will be one more meeting of the committee, a 2 + 2 Project signing party.

Mr. Williams made the motion that the meeting be adjourned. All members approved.

MINUTES
FACILITIES AND EQUIPMENT SUB-COMMITTEE MEETING
2 + 2 ELECTRONICS PROJECT
GAINESVILLE HIGH SCHOOL AND COOKE COUNTY COLLEGE

May 24, 1989

The Facilities and Equipment Sub-Committee members met May 24, 1989 for final discussion of plans for equipment and facilities of the 2+2 Electronics Project. The meeting site was the Gainesville High School Library.

MEMBERS PRESENT: Mr. Joe Shults, Mr. Jack Smith, Mr. Charles Uselton, Mr. Tom Loftin, Mr. Glenn Stockard, and Mr. Whitten Williams.

MEMBERS ABSENT: Dr. Luther Bud Joyner, Mr. Bill McCarley, Ms. Margaret Duncan, Ms. Patty Gilbert, Mr. Tom Woods, Dr. Dale Alsup, Dr. Doug Keenan, Mr. Clyde Yeatts, Mr. George Pavelek, and Mr. Joe Ware.

I. WELCOME

Mr. Joe Shults welcomed members and informed them of the packets containing the Program Support Equipment Priority One Recommendation and Capital Outlay.

II. STAFF ACTIVITIES

Mr. Shults informed members that four major vendors had displayed equipment, recommendations and proposals. Also three additional vendors were contacted. The staff has produced two proposals for the committee members to approve. Feedback from the field of industry included a letter of support from Mr. Dick Zielinsky of Saturn Corporation of General Motors.

Consultants used were Mr. Les Stewart, Dr. Doug Keenan, and Dr. Kenneth Washburn.

Mr. Shults noted that all vendors had very good proposals and from a practical stand point, he recommended the committee not use strictly one vendor. It would be more economical to both institutions (CCC and GISD) to break equipment between vendors.

The major contributor is NIDA Corporation. It's open-ended and computer aided. This company is world wide and their product is primarily developed for military purposes.

Mr. Shults noted that all equipment viewed will be serviceable, noting that Heath-Kit equipment would be on the low end of the spectrum. Mr. Shults noted that one board member of CCC Trustees noted to Dr. Joyner, "You are going to use State-of-the-Art equipment, aren't you?", in their meeting of May 15, 1989.

Mr. Shults recommended 5 manual systems and 1 computer aided instructional system.

There was further discussion of other companies' proposals for equipping the program. Discussion also included the possibility of a 3 year lease purchase agreement with NIDA.

Tom Loftin asked about Principles of Technology. "Is the $24,000 for a 1 or 2 year plan?"

Mr. Jack Smith informed members that Principles of Technology is a 2 year plan, and the $24.000 is for one years worth of equipment.

Conclusion of members discussion was Principles of Technology will not be offered within 1989-1990 school year.

Discussion revolved around the cost for the college and the high school to start up the program.

Tom Loftin felt the cost at the high school was fair.

Whit Williams felt the cost at the college was more than could be afforded. Consideration was given to revising the proposal for the 2nd year at the college in an effort to reduce the cost. It was pointed out that grant money is available.

Glenn Stockard commented on changes etc: " Microprocessors change most frequently but is basically the same throughout. There is not any change in theory, changes occur in the applications of the theory. There is nothing in the proposal that will out-date itself within the foreseeable future."

Consideration was given as to how to implement the program at the central facility (GHS) with the college using the central facility for the first year. Equipment needs for the first year at the college using high school facility was discussed.

In conclusion, Mr. Shults recommended that promotional literature for the 2+2 Electronics Program be developed by the Public Relations office at CCC.

MINUTES - REGULAR MEETING

BOARD OF TRUSTEES
COOKE COUNTY COLLEGE

May 15, 1989

The Board of Trustees of Cooke County College met in regular session on Monday evening, May 15, 1989. The meeting was held in Room 154 of the Student Activities Center at 7:00 p.m. Board Chairman, Mr. Urban J. Endres, presided for the meeting. Mr. Neil Tibbets, Secretary, offered the invocation.

MEMBERS PRESENT:	Urban J. Endres, Chairman, Dr. Milton Dickson, Vice Chairman Neil Tibbets, Secretary, Wendell Protter, Alan Ritchey, and Karon Sullivant.
MEMBERS ABSENT:	Don Gregory
ADMINISTRATORS PRESENT:	Dr. Luther Bud Jovner, President, Whitten Williams, Tom Woods, Dr. Eddie Hadlock, Linda Mast and Rodger Boyce
VISITORS PRESENT:	Eric Williams, Editor, Gainesville Daily Register, James M. Brooks, Vice President, Southwest Securities, Inc., Jimmy L. Inman, Architect, Joe Shults, Coordinator, 2+2 Electronics Technology Development Project and Jack Smith, Instructor/Coordinator,2+2 Electronics Project, Gainesville ISD

DISPOSITION OF MINUTES OF PREVIOUS MEETINGS

Dr. Dickson made a motion that the minutes of the meeting of April 10, 1989, be approved as presented. Mrs. Sullivant seconded the motion and it carried unanimously.

Minutes of the meeting of May 8, 1989, were unanimously approved as presented following a motion by Mr. Tibbets and seconded by Mr. Protter.

NEW BUSINESS

[1776] APPROVE BILLS

Dr. Dickson made a motion to approve the current operating fund bills in the amount of $186,274.25, and the auxiliary bills in the amount of $48,631.42. Mr. Tibbets seconded the motion and it carried unanimously.

[1777] TRANSFER FUNDS

Mrs. Sullivant made a motion to transfer funds as requested. Mr. Tibbets seconded the motion and it carried unanimously.

The following fund transfers were requested:

General Fund to Current Operating Fund	$160.058.47
(Monthly bill lists less cancelled checks of $1.621.88)	
Federal Grants Fund to Current Operating Fund	$20.165.00
State Scholarship Fund to Current Operating Fund	$ 4.428.00
	$184.652.37

[1778] SECOND READING ON PROPOSAL ON INSTITUTIONAL AIMS AND OBJECTIVES

The revised statement of aims and objectives for Cooke County College for the Southern Association accreditation study were presented to the Board at the March 13 meeting with the understanding that a second reading would be necessary for final approval.

Final revisions from the Committee on Institutional Purpose were presented. Also, Dr. Hadlock presented additional changes to the College catalog for the Board's consideration. Following presentation from the committee and Dr. Hadlock, Mrs. Sullivant made a motion that the Board approve recommended changes to the catalog and that the institutional aims and objectives become the official Cooke County College Purpose Statement. Mr. Tibbets seconded the motion. Motion carried by a unanimous vote.

[1779] CONSIDERATION OF ELECTRONIC PROGRAM

Mr. Joe Shults, Coordinator of the 2+2 Electronics Technology Development Project, presented a proposed College Electronics Technology Program. [Copy of the proposed program is attached and made a part of these minutes.]

Following the presentation and a recommendation for approval from the administration, Mr. Ritchey made a motion that the Board approve the program. Dr. Dickson made a second to the motion and it carried unanimously.

Mr. Proffer then made a motion that the Board authorize the administration to enter into an articulation agreement with the Gainesville Independent School District and Cooke County College. Mr. Tibbets seconded Mr. Proffer's motion and the motion carried by a unanimous vote.

This agreement would provide a mechanism through which vocational-technical educatio programs at Gainesville ISD and CCC will interface, thereby enabling students who have master agreed-upon task competencies in vocational-technical programs at GISD to receive post-secondary credit at CCC.

[1780] CONSIDERATION OF BIDS ON COMPUTER EQUIPMENT FOR THE REGISTRAR'S OFFIC

As recommended, Dr. Dickson made a motion that the Board approve the purchase of the IBM 8570-121 PS/2 Model 70 386 PC and related equipment with a 2nd Diskette Drive from IBM, the lo bidder for the equipment. [Copy of the bid tabulation is attached and made a part of these minutes.] Mrs. Sullivant seconded the motion. The motion carried by a unanimous vote.

[1781] CONSIDER SALE OF GENERAL OBLIGATION AND REVENUE BONDS

Mr. James Brooks, Financial Advisor for the College, made a presentation regarding sale bonds. Following his discussion, Dr. Dickson made a motion that the Board accept bids for the sale all general obligation and revenue bonds, with bids to be considered by the Board on June 12 12:00 noon. Mrs. Sullivant made a second to the motion and it carried by a unanimous vote.

BEST COPY AVAILABLE

[1782] REPORT ON CONSTRUCTION

Mr. Jimmy L. Inman, Architect, announced that the final inspection of the renovation project in the 100 building had just been completed. He recommended acceptance of the work following a few minor adjustments.

[1783] APPROVAL OF AUCTIONEER

Following approval recommendation by the administration, Mr. Proffer made a motion that the College use the services of Mr. Mike Jones as the auctioneer for the next College auction to be held in late May or early June. Mr. Tibbets seconded the motion. Motion carried unanimously.

PRESIDENT'S REPORT

[1784] REPORTS

(1) The College received notice that a nursing grant has just been awarded in the amount of $30,000 to be used for a simulation lab.

(2) The Cooke County Pep Rally will be held on the College campus on Friday evening, May 19. This will be the third annual rally presented by students from South Plains College and a large crowd is expected for the event.

(3) An updated legislative report was given by President Joyner.

(4) Mrs. Sullivant recommended that a letter be sent from the Board members to "Friends of Cooke County College" in appreciation of the hard work and financial assistance given during the bond issue campaign. The Board members agreed.

ADJOURNMENT

There was no further business and the meeting was adjourned.

GAINESVILLE INDEPENDENT SCHOOL DISTRICT

MINUTES OF REGULAR MEETING - MAY 10, 1989

The Gainesville Board of Education met in regular meeting on Wednesday, May 10, 1989 at 6:00 p.m. in the school Administration Building, 1201 Lindsay Street, with the following members present: June McCain, James Marshall, John Morris, Frank Lorne, Larry Claxton, Mike Otts, and Roger Martin. Others present were Charlie Uselton, Tom Loftin, George Burrow, Earl Husfeld, Eddie Green, Nancy Fisher, Skip Rigsby, Mary Moore, Sharon Keeling, Karen Treat, and patrons of the district.

President Morris called the meeting to order at 6:00 p.m.

Mr. Lorne moved and Mr. Martin seconded a motion that the minutes of the April 25, 1989 meeting be approved as presented. The motion carried unanimously.

Mr. Billy Miller, teacher at Gainesville High School, requested that the board restore the teacher supplement, professional days and local sick days for the 1989-90 school year.

Mr. Rigsby, Assistant High School Principal, introduced Keith Rigsby, 1988-89 Student Body President. Mr. Morris presented Keith Rigsby with a plaque.

Mr. Rigsby introduced the 1989-90 Student Body President, Chris Lewis.

The board discussed the hiring of a delinquent tax attorney and no action was taken at this time.

Mr. Loftin reported on the TEAMS test report data.

Discussion of the roof problems and addition at Edison Elementary School was held. Information was presented by Mr. Uselton, Mr. Burrow, and Mr. Husfeld. Mr. Martin moved and Mr. Claxton seconded a motion authorizing Mr. Uselton to hire an architect to proceed with plans and specifications to replace the roof at Edison Elementary School. The motion carried unanimously.

Mr. Martin moved and Mr. Claxton seconded a motion that plans and specifications be drawn up for additions to Edison Elementary School. After discussion, the motion was withdrawn.

The board authorized Mr. Uselton to check with an architect to determine the approximate cost of developing plans and specifications for classroom additions to Edison Elementary and report back to the board.

Mr. Husfeld introduced Jo Anne Morrison, new Gainesville ISD food service director. Mr. Coker presented a status report of Gainesville ISD food service operation as of April 30, 1989.

The board discussed the Employee Appreciation Program scheduled for June 3, 1989, 10:00 a.m. at the Gainesville Middle School Auditorium. The program will have the same basic format as last year's program.

Mrs. McCain moved and Mr. Martin seconded a motion to approve the 1988-89 Career Ladder assignments and amount of funding as presented by the administration - Level 3 - $3,034.62; Level 2 - $1,517.31. Stricter criteria was applied. The motion carried unanimously.

Mrs. McCain moved and Mr. Lorne seconded a motion approving the restructured guidelines for admission into Gainesville Middle School Honors Class as presented by principal Eddie Green. The guidelines were approved for one year only. The motion carried unanimously.

Mr. Martin moved and Mr. Marshall seconded a motion to approve the 2+2 Electronics Program Articulation Agreement between Cooke County College and Gainesville ISD as presented. The motion carried unanimously.

Mr. Uselton reported on the following:

Receipt of letter from Tarleton State University concerning Angela Webb.
Receipt of letter from Gary and Jo Glenn, whose children attend Lee Elementary.
Board president and board member training school offered in Austin on June 16-17, 1989.

Mr. Marshall moved and Mrs. McCain seconded a motion approving the lease-purchase of a Collins Super Bantam, 12 seat and two wheelchair position school bus from Bridges-Hemphill Enterprises, Inc. Cash purchase price is $26,339, to be paid with federal monies. The motion carried unanimously.

The board went into executive session at 8:10 p.m. after the president announced its right to do so under Article 6252-17, Section 2(g) to discuss personnel.

The board reconvened in open meeting at 8:40 p.m.

Mr. Marshall moved and Mrs. McCain seconded a motion to increase Glenn Fry's coaching supplement from $1500 to $3400 for 1989-90. The motion carried unanimously.

Mr. Marshall moved and Mrs. McCain seconded a motion that Linda Woods receive a $600 supplement for sponsor of Gainesville High School Yearbook. The motion carried unanimously.

Mrs. McCain moved and Mr. Claxton seconded a motion that Frances Hutcherson be employed full-time for the 1989-90 school year. The motion carried unanimously.

Mrs. McCain moved and Mr. Claxton seconded a motion that the resignation of Melanie Lindsey, effective at the close of the 1988-89 school year, be accepted. The motion carried unanimously.

Mrs. McCain moved and Mr. Marshall seconded a motion that Mrs. Selby and Mrs. Pirkey, high school secretaries, employment be extended to 11 months (202 days). The motion carried unanimously.

Mr. Lorne moved and Mrs. McCain seconded a motion that the bills be approved for payment covering checks numbered 10676 through 10807 from Local Maintenance, and Nos. 659 through 665 from Special Revenue. The motion carried unanimously.

Mr. Marshall moved and Mr. Lorne seconded a motion approving the April, 1989 Financia Statement. The motion carried unanimously.

Mr. Husfeld presented year-to-date and monthly payment recap as of April 30, 1989, as prepared by the office of Joyce Zwinggi, Cooke County Tax Assessor/Collector.

There being no further business, the meeting was adjourned at 8:50 p.m.

Secretary

President

COOKE COUNTY COLLEGE
GAINESVILLE, TEXAS 76240

ELECTRONIC PROGRAMS DEVELOPMENT

March 15, 1990

AGENDA
ADVISORY COMMITTEE MEETING

7:00 PM Introductions of committee members and guests.

7:15 PM Dinner will be served.

8:00 PM Open the meeting

Topics to be discussed

1. Program Revisions

   a. Electronics Technology

   b. Electronics Engineering Technology

2. Manual of Procedures

   (2 + 2 Project Grant Obligation)

COOKE COUNTY COLLEGE
GAINESVILLE ISD
2 + 2 Electronics Programs

Advisory Committee Members

Mr. Fred Camp
Valenite Employee

Mr. Bob Dumas
Valenite Employee

Mr. Will Bezner
Vice President Technical Services
Polly Pipe Industries

Mr. Toby Thompson
Engineering
Weber Aircraft

Mr. Adam Wolf
Industrial Engineer
Weber Aircraft

Ms. Lou Ann Cole
Training & Education Administration
Texas Instruments

Ms. Greta Miller
Curriculum Director
Sanger ISD

Cooke County College Personnel

Dr. Douglas Crawford
Dean of Instruction

Mr. William Stanley
Division Director of Science/Technology

Mr. Joe Ware
Head of Technology Department

Mr. Whitten Williams
Dean of Administrative Services

Mr. William R. Caver
Director of Counseling and Testing

Dr. Dale Alsup
Math/Physics Instructor

Mr. James Yerks
Electronics Instructor

Recording Secretary

Ms. Nancy Herrington
Office of Dean of Instruction
Cooke County College

Gainesville ISD Personnel

Mr. Thomas Loftin
Assistant Superintendent

Mr. Bill McCarley
Principal

Mr. Jack Smith
Electronics Instructor

Mrs. Margaret Duncan
High School Counselor

Mr. Mike Martin
Vocational Counselor

Special Invited Guests

Mr. Eduardo Gaytan
Associate Program Director
Texas Higher Education Coordinating Board

Mr. Thomas Risinger
Occupational Education Specialist
Texas Education Agency

Ms. Dee Monroe
Occupational Education Specialist
Texas Education Agency

Dr Robert Ray
Drafting Instructor
Cooke County College

Ms. Anne Froehlich
Office of Electronics
Cooke County College

ELECTRONICS ADVISORY COUNCIL MEETING

March 15, 1990

The Advisory Council for the 2+2 Electronics programs at Cooke County College and Gainesville Independent School District met March 15, 1990, for a dinner meeting. Council members attending included Fred Camp and Bob Dumas, Valenite, Corp.; Will Bezner, Poly Pipe Industries; Toby Thompson and Adam Wolf, Weber Aircraft; and Mrs. Greta Miller, Curriculum Director of the Sanger Independent School District.

Special guests were Thomas Risinger and Ms. Dee Monroe, Occupational Education specialists from the Texas Education Agency in Austin.

Representing Gainesville ISD. were Tom Loftin, Assistant Superintendent; Bill McCarley, Gainesville High School Principal; Margaret Duncan, GHS Counselor, and Jack Smith, Electronics instructor at GHS. Cooke County College personnel included Dr. Doug Crawford, Dean of Instruction; Bill Stanley, Director, Division of Science and Technology; Joe Ware, Chairman, Department of Technology; Whit Williams, Dean of Administrative Services; Bill Caver, Director of Counseling and Testing; Bob Ray, Drafting instructor; James Yerks, Electronics instructor; Anne Froehlich, secretary in the Electronic programs; and Nancy Herrington, Secretary to the Dean of Instruction and recording secretary.

Dr. Doug Crawford made the introductions and served as moderator. After explaining the differences in the two programs at Cooke County College -- Electronics Technology and Electronics Engineering Technology -- he turned the floor over to James Yerks.

Mr. Yerks went through the proposed changes as listed on the outline distributed to those present. (A copy has been made a part of these minutes.)

The following are suggested revisions for both programs, and the actions taken on each revision by the Advisory Council:

1. Suggested revision: That there no longer be accelerated blocks (19 days each) for any of the electronics classes as previously required.

   Action taken: Approved

2. Suggested revision: That there no longer be the stipulation that students are required to enroll in all electronics classes listed in the schedule of classes.

Action taken: Approved

3. Suggested revision: Require Engineering Drafting as part of the programs since this course is a prerequisite for Electronics Drafting.

   Action taken: Approved

4. Suggested revision: Rename "Solid State Devices and Analog Circuits" to "Semiconductor Circuits."

   Action taken: Approved

The following are suggested revisions to the Electronics Technology program, and the actions taken on each revision:

1. Suggested revision: Replace "Introduction to Computers" with "Introduction to Programming (BASIC)".

   Action taken: Approved

2. Suggested revision: Eliminate "Computer Programming (PASCAL) from the program.

   Action taken: Approved.

3. Suggested revision: Eliminate the 16 hours of lab for "Unified Technical Concepts - Physics" as currently listed.

   Action taken: Disapproved. Consensus of the Advisory Council was the lab experience is very important since many students will be going to work directly into laboratories and need the "hands-on" lab situations while in college.

The following are suggested revisions to the Electronics Engineering Technology program, and the actions taken on each by the Advisory Council.

1. Suggested revision: Add "or Introduction to Programming (BASIC)" when listing "Computer Programming (PASCAL)".

   Action taken: Approved. (PASCAL to be used for programers; BASIC for users.)

2. Suggested revision: Eliminate "Technical Writing" or replace "Literature and Composition" with "Technical Writing".

Action taken: Disapproved. Consensus of the Council was that the currently required courses in English (9 hours) should remain in the curriculum, since it was felt that no one can ever take too much English; that Technical Writing is hard enough without eliminating the current English pre requisite; and students planning to go on to a four-year university need the nine hours of English.

3. Suggested revision: Eliminate "Flexible Manufacturing Applications" from the curriculum.

Action taken: Approved.

There being no further discussion on the CCC program, Dr. Crawford then asked Jack Smith to present suggested changes to the program at Gainesville High School. (A copy has been made a part of these minutes.)

Mr. Smith said there was only one change he would like to present, and that was deleting "Solid State Devices and Analog Circuits" from the curriculum and replacing it with "Digital Logic Circuits". The gave the following as rationale for the proposed change.

1. Solid State Devices and Analog Circuits is a continuation of the present DC/AC courses with an introduction of many components and their interaction, which is more concentrated than what is needed to raise the interest of the prospective high school student.

2. Adding Digital Logic Circuits to the curriculum will create more interest than having an all analog curriculum which is what would exist without a change. This will allow more versatility for the program at the high school level.

3. Digital Logic Circuits will lend itself to understanding how a computer operates internally for those who complete the course.

4. Solid State Devices requires a pre-requisite; Digital does not.

After general discussion, the Council agreed to approve the change to the high school program.

MANUAL OF PROCEDURES

Dr. Crawford told the Council that since our program is to be used as a model for other 2+2 programs, Mr. Yerks and Mr. Smith have compiled a "Manual of Procedures." (Copies were distributed to everyone present, and a copy has been made a part of these minutes.) Dr. Crawford said that even though the manual is not yet complete, it is a start. He then asked each Advisory Council member to read over it and make any suggestions they feel

appropriate. As part of the grant, the manual has to have Advisory Council approval prior to April 1.

TELECONFERENCE

Dr. Crawford told about the new satellite dish recently installed at Cooke County College and about a teleconference on "Electronics Technology Programs for the 90s" to be broadcast on May 2. He said that CCC has hopes to use this teleconference as the initial one held at CCC, and invited everyone to attend. More information will be mailed at a later date. (A copy of the flyer distributed to those present has been made a part of these minutes.

There being no further business, the meeting was adjourned.

Respectfully submitted:

Nancy Herrington

Nancy Herrington,
Recording Secretary

GAINESVILLE HIGH SCHOOL

ELECTRONICS

SYLLABUS

I. **COURSE**: DC Circuit Analysis

II. **TEXT**: *Basic Electronics*, 5th Edition, GROB, 1984, McGraw-Hill Book Company.
Electricity-Electronics Fundamentals, 3rd Edition, ZBAR and SLOOP, 1986, McGraw-Hill Book Company.

III. **TERMINAL OBJECTIVES**: Upon successful completion of this course of study, each student will have demonstrated mastery of DC circuit analysis laws, theorems, and applications by attaining an overall grade of C or above on written examinations, laboratory reports, and practical examinations. Each enabling objective will define specific bodies of knowledge and/or skills to be learned. The expected competency level for each enabling objective is 100% unless otherwise stated. The evaluation of levels of competencies for each enabling objective will be in accordance with procedures outlined in Section VI & VII of this syllabus. Grades will be awarded based on that procedure.

IV. **ENABLING OBJECTIVES**: Each student will be able to:

1. Read the electrical and mechanical safety rules. Each student is expected to understand and practice good safety while engaged in this program. The level of compliance is absolutely without exception.

2. Define the properties of electrical energy, without the aid of notes, above an accuracy level of 65%.

3. With the use of the periodic table of atomic structure, identify and classify those elements that are useful as conductors, insulators, and semi-conductors with an accuracy of 65%.

4. Be able to identify specific resistor values according to standard electrical industry markings.

5. Be able to use a scientific calculator to perform any and all mathematical computations required in this course of instruction.

6. Be able to express Ohm's Law in all of its mathematical forms.

7. When given drawings of series circuits, be able to indicate the direction of current flow by labeling the components with the correct symbols.

8. Be able to differentiate between linear and non-linear resistors.

9. Be able to recognize the difference between series and parallel circuits.

10. Be able to predict the voltage distribution around selected series, parallel, and series-parallel circuits.

11. Be able to determine quantitative current flows in selected series, parallel, and series-parallel circuits.

12. Be able to compute the power requirements and power distribution of selected series, parallel, and series parallel circuits.

13. Be able to draw the schematic symbols for selected direct current (DC) components that conform to the Institute of Electrical and Electronics Engineers (IEEE) Standard 225.

14. Be able to safely and accurately operate selected DC test instruments.

15. Be able to apply Kirchhoff's Laws in the analysis of DC circuits.

16. Be able to apply the Superposition Theorem to DC circuits with two power sources.

17. Be familiar with the purpose and use of Thevenin's, Norton's, and Millman's Theorems. The level of performance will be such as to invoke each theorem with the aid of the required text and notes.

1 Describe the six methods of producing an EMF (friction, chemical activity, pressure, heat, magnetism, and light).

19. Define volt, ampere, ohm and watt.

20. Identify insulators and conductors.

21. Read meter scales and interpolate meter readings.

22. Identify the ohmic value of resistors using the resistor color code.

23. Identify basic electronic symbols.

24. Use Ohm's Law to solve problems.

25. Define direct current (DC).

26. Define and explain capacitance and inductance.

27. Draw series DC circuits and solve for unknown values using Ohm's Law and Kirchhoff's Law.

28. Draw parallel DC circuits and solve for unknowns using basic laws and circuits rules.

29. Draw series-parallel DC circuits and solve for unknowns using basic laws and circuit rules.

30. Measure volts with a voltmeter.

31. Use an ohmmeter to determine if the resistors are within tolerance according to color code.

32. Measure current with an ammeter.

33. Identify short circuits.

34. Identify open circuits.

35. Construct a series resistive circuit; measure voltage drops, current, resistance, and compute

power.

36. Construct a parallel circuit, measure voltage drops, current, resistance, and compute power.

37. Construct a series-parallel resistive circuit and measure voltage drops, current, resistance, and compute power.

38. Test a fuse.

39. Test a switch.

40. Test a potentiometer.

V. COURSE OUTLINE

CONTENT

THEORY	LABORATORY
	Laboratory Orientation: 1. Materials Location 2. Safety 3. Requirements for Laborator
Unit 1 - Electricity 13	
1. Negative and Positive Polarities 2. Electrons and Protons in the Atom 3. Structure of the Atom 4. The Coulomb Unit of Charge 5. The Volt Unit of Potential Difference 6. Charge in Motion is Current 7. Resistance is Opposition to Current 8. The Closed Circuit 9. Direct Current (DC) and Alternating Current (AC) 10. Sources of Electricity	Experiment — Unit 1 1
Unit 2 - Ohm's Law 36	
1. The Current I = V/R 2. The Voltage V = IR 3. The Resistance R = V/I 4. Practical Units 5. Multiple and Submultiple Units 6. The Linear Proportion between V and I 7. Electric Power 8. Power Dissipation in Resistance 9. Power Formulas 10. Electric Shock	Experiment — Unit 2 2

Unit 3 - Series Circuits 52

1. Why I is the Same in All Parts of a Series Circuit
2. Total R Equals the Sum of All Series Resistances
3. Series IR Voltage Drops
4. The Sum of Series IR Drops Equals the Applies Vr
5. Polarity of IR Voltage Drops
6. Polarities to Chassis Ground
7. Total Power in a Series Circuit
8. Series-Aiding and Series-Opposing Voltages
9. Analyzing Series Circuits
10. Effect of an Open Circuit in a Series Path — Experiment — Unit 3

Unit 4 – Parallel Circuits 70

1. The Applied Voltage Va Is the Same Across Parallel Branches
2. Each Branch I Equals Va/R
3. The Main-Line Ir Equals the Sum of the Branch Currents
4. Resistances in Parallel
5. Conductances in Parallel
6. Total Power in Parallel Circuits
7. Analyzing Parallel Circuits
9. Effects of a Short Circuit Across Parallel Branches — Experiment — Unit 4

Unit 5 - Series-Parallel Circuits 8

1. finding Rr for Series-Parallel Resistances
2. Resistance Strings in Parallel
3. Resistance Banks in Series
4. Resistance Banks and Strings in Series-Parallel
5. Analyzing Series-Parallel Circuits
6. Wheatstone Bridge
7. Chassis-Ground Connections
8. Voltages Measured to Chassis Ground
9. Opens and Shorts in Series-Parallel Circuits — Experiment — Unit 5

Unit 6 - Resistors 106

1. Types of Resistors
2. Resistor Color Coding
3. Variable Resistors
4. Rheostats and Potentiometers
5. Power Rating of Resistors
6. Choosing the Resistor for a Circuit
7. Series and Parallel Combinations of Resistors
8. Resistor Troubles — Experiment — Unit 6

Unit 7 - Voltage Dividers and Current Dividers 126

1. Series Voltage Dividers
2. Current Divider with Two Parallel Resistances
3. Current Division by Parallel Conductances
4. Series Voltage Divider with Parallel Load Current
5. Design of a Loaded Voltage Divider

Experiment — Unit 7

Unit 8 - Direct-Current Meters 138

1. Moving-Coil Meter
2. Measurement of Current
3. Meter Shunts
4. The Ayrton or Universal Shunt
5. Voltmeters
6. Loading Effect of a Voltmeter
7. Ohmmeters
8. Multimeters
9. Digital Multimeter (DMM)
10. Meter Applications
11. Checking Continuity with the Ohmmeter

Experiment — Unit 8

Unit 9 - Kirchhoff's Laws 168

1. Kirchhoff's Current Law
2. Kirchhoff's Voltage Law
3. Method of Branch Currents
4. Node-Voltage Analysis
5. Method of Mesh Currents

Experiement — Unit 9

Unit 10 - Network Theorems 182

1. Superposition
2. Thevenin's Theorem
3. Thevinizing a Circuit with Two Voltage Sources
4. Thevenizing a Bridge Circuit
5. Norton's Theorem
6. Thevenin-Norton Conversions
7. Conversion of Voltage and Current Sources
8. Millman's Theorem
9. T and r Networks

Experiment — Unit 10

Unit 11 - Conductors and Insulators 208

1. Function of the Conductor
2. Standard Wire Gage Sizes
3. Types of Wire Conductors
4. Printed Wiring
5. Switches
6. Fuses
7. Wire Resistance
8. Temperature Coefficient of Resistance
9. Ion Current in Liquids and Gases
10. Electrons and Hole Charges in Semiconductors
11. Insulators
12. Troubleshooting Hints

Experiment— Unit 11

Unit 12 - Power Sources 230

1. General Features of Batteries
2. The Voltaic Cell
3. Carbon-Zinc Dry Cell
4. Alkaline Cell
5. Additional Types of Primary Cells
6. Lithium Cell
7. Lead-Acid Wet Cell
8. Additional Types of Secondary Cells
9. Series and Parallel Cells
10. Current Drain Depends on Load Resistance
11. Internal Resistance of a Generator
12. Why the Terminal Voltage Drops With More Load Current
13. Constant-Voltage and Constant-Current Sources
14. Matching a Load Resistance to the Generator

Experiment— Unit 12

NOTE: The theory section of this syllabus was extracted in part form the required course text, for the convenience of the student.

VI. **METHODS OF INSTRUCTION:**

Methods of instruction will be as follows:

1. Lecture/Discussion
2. Demonstration/Discussion
3. Required Reading
4. Laboratory Experiments and Reports
5. Audio/Visual Aids

VII. **METHODS OF EVALUATION:**

Evaluation will be competency based utilizing the following tool:

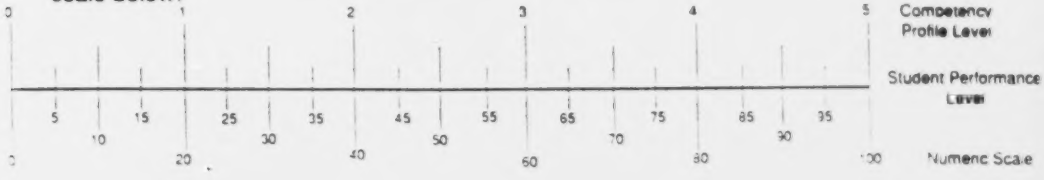
1. Written Examinations
2. Laboratory Experiment Reports
3. Practical Examinations
4. Unannounced Quizzes
5. Daily Observations

VIII. **GRADES:** A letter grade will be awarded to each student according to their numeric standing as outlined below:

90 - 100	A
80 - 89	B
75 - 79	C
70 - 74	D
Below 69	F

A students numeric standing will be determined by the following system:

1. All sub elements of the numeric standing will be based on a raw score of 100.
2. All cognative written examinations will be objective.
3. All competency evaluations will be subjective using the completency based weighted scale below:



Major Written Examinations	=	50%
Laboratory Experiment Reports	=	20%
Major Practical Examinations	=	20%
Unannounced Quizzes	=	5%
Daily Observation	=	5%

Example:

Average mid-term exam and final exam equals 90:	then 90 x .5	=	45
Average lab report grade equals 80:	then 80 x .2	=	16
Average practical grade equals 100:	then 100 x .2	=	20
Average of all unannounced quizzes equals 60:	then 60 x .05	=	3
No deduction for daily observation:	then 100 x .05	=	5
	TOTAL		89

Numeric Score = 89 = B

IX. **STUDENT CONDUCT:**

1. Students are expected to be prompt, courteous, studios, and honest.
2. Make-up work will be allowed for excused absenced only.
3. Reading assignments are to be completed prior to attending associated lecture and/or laboratory sessions as applicable.
4. Note taking is encouraged, but will not be graded.

X. **ADMINISTRATIVE INFORMATION AND/OR REQUIREMENTS:**

A. Lecture
1. Location: Building _____ Room _____
2. Time: Start _____ Stop _____
3. Dates: M _____ Tu _____ W _____ Th _____ F _____ S _____
4. Mid-Term Exam: Mo _____ Date _____ Time _____ Location _____
5. Final Exam: Mo _____ Date _____ Time _____ Location _____

B. Laboratory
1. Location: Building _____ Room _____
2. Time: Start _____ Stop _____
3. Date: M _____ Tu _____ W _____ Th _____ F _____ S _____
4. Mid-Term Practical Exam: Mo _____ Date _____ Time _____ Location _____
5. Final Practical Exam: Mo _____ Date _____ Time _____ Location _____

C. Laboratory Report Schedule

Experiment	Due Date	Experiment	Due Date
Unit # 1	Mo _____ Date _____	Unit # 7	Mo _____ Date _____
Unit # 2	Mo _____ Date _____	Unit # 8	Mo _____ Date _____
Unit # 3	Mo _____ Date _____	Unit # 9	Mo. _____ Date _____
Unit # 4	Mo _____ Date _____	Unit # 10	Mo _____ Date _____
Unit # 5	Mo _____ Date _____	Unit # 11	Mo _____ Date _____
Unit # 6	Mo _____ Date _____	Unit # 12	Mo _____ Date _____

D. Instructor:

1. Name: _____

2. Location: Building _____ Room _____

3. Phone: 817/668-7731 Ext: _____

4. Office Hours:
Monday _____ to _____
Tuesday _____ to _____
Wednesday _____ to _____
Thursday _____ to _____
Friday _____ to _____

NOTE: Students are encouraged to visit during office hours, and other times of opportunity, to resolve problems of any nature.

GAINESVILLE HIGH SCHOOL

ELECTRONICS

SYLLABUS

I. **COURSE**: AC Circuit Analysis

II. **TEXT**: *Basic Electronics*, 5th Edition, GROB, 1984, McGraw-Hill Book Company.
Electricity-Electronics Fundamentals, 3rd Edition, ZBAR and SLOOP, 1986, McGraw-Hill Book Company.

III. **TERMINAL OBJECTIVES**: Upon successful completion of this course of study, each student will have demonstrated mastery of AC Circuit laws, theorems, and applications by attaining an overall grade of C or above on written examinations, laboratory reports, and practical examinations. Each enabling objective will define specific bodies of knowledge and/or skills to be learned. The expected competency level for each enabling objective is 100% unless otherwise stated. The evaluation of levels of competencies for each enabling objective will be in accordance with procedures outlined in Section VI and VII of this syllabus. Grades will be awarded based on that procedure.

IV. **ENABLING OBJECTIVES**: Each student will be able to:

1. Read, understand, and follow the standard safety rules while in an electronics classroom and/or laboratory. The expected level of performance is absolute without exception.
2. Define the characteristics of capacitors.
3. Explain the charge and discharge characteristics of capacitors verbally and mathematically.
4. With the aid of manufacturer specification sheets, be able to identify specific capacitance rating for selected capacitors.
5. Explain the properties of magnets and the forces surrounding them.
6. Explain the term "magnetomotive force", and its practical uses.
7. Determine the field strength around a magnet mathematically.
8. Define the term "inductance", and its practical application in electronic circuits.
9. Explain and apply Faraday's Law to selected inductors.
10. Differentiate between different types of inductors.
11. Compute and plot charge and discharge curves for selected capacitors and inductors with the aid of the universal time constant chart.
12. Be able to explain the characteristics of a sinusoidal alternating current wave.
13. When given the period of sine wave, determine the frequency of the wave.
14. Identify various types of transformers and predict their output.

15. Differentiate between RMS, peak, peak to peak, and average voltage values.

16. With the aid of selected test instruments, determine the phase relationship between AC generators.

17. Explain the term :"reactance", and its effect on capacitors and inductors, with the aid of phaser diagrams.

18. Identify and explain the occurrence of resonance verbally and mathematically.

19. Differentiate between series and parallel filters.

20. Analyze the interactive effect of AC current in circuits composed of inductors, capacitors, and resistors.

21. Construct and test RC and RL time constant circuits.

22. Define alternating current (AC) and explain its primary advantage over DC.

23. Explain terms related to frequency.

24. Describe inductance.

25. Describe inductive reactance.

26. Describe capacitance.

27. Describe capacitive reactance.

28. Describe how capacitive reactance and inductive reactance affects the voltage and current relationships in an AC circuit.

29. Describe impedance in an AC circuit.

30. Calculate impedance, phase angle and power factor.

31. Describe the basic use and operation of AC test equipment; i.e., "O" scope, AC meters, frequency counters, and signal generators.

32. Calculate the turns, current, voltage, and power relationship for single-phase transformers.

33. Measure AC volts with a voltmeter.

34. Operate a function generator.

35. Determine voltage and frequency with an oscilloscope.

36. Identify basic electronic symbols.

37. Locate and identify and open circuit.

38. Test a transformer circuit.

39. Construct a resonant circuit and determine resonant frequency and bandwidth.

40. Construct and test filter circuit.

41. Test and identify capacitors.

42. Construct series and parallel circuits. Measure voltage drops, current. Calculate impedance, phase angle, and power.

43. Use the oscilloscope to measure waveforms.

44. Use analog multimeters, digital multimeters, oscilloscopes, and frequency counters to analyze the operation of analog and pulse circuits.

45. Calculate characteristic impedance and impedance matching of transmission lines.

V. COURSE OUTLINE

CONTENT

THEORY	LABORATORY
Unit 1 - Capacitors:	Laboratory Orientation: 1. Materials Location 2. Safety 3. Laboratory Report Requirements
1. Electrostatic Fields 2. Charging Action in a Capacitor 3. Storing Charges in a Capacitor 4. Discharging a Capacitor 5. The Farad 6. Dielectrics 7. Factors Affecting Capacitors 8. Voltage Ratings 9. Types of Capacitors 10. Capacitors in Parallel 11. Losses in a Capacitor 12. Frequency and Capacitance Characteristics 13. Capacitor Coding system	Experiment — Unit 1
Unit 2 - Magnetic Circuits and Electromagnetism	
1. Permanent Magnets 2. Magnetic Fields 3. Magnetic Domains 4. Magnetism Produced by current 5. Concentration of a Magnetic Field in a Solenoid 6. Magnetomotive Force 7. Magnetic Flux 8. Flux Density 9. Magnetic Field Intensity 10. Permeability 11. B-H Curve 12. Hysteresis Losses 13. Magnetic Circuits	Experiment — Unit 2

Unit 3 - Inductance

1. Inductance Defined
2. Factors Determining Strength of Induced Voltage
3. Faraday's Law
4. Nature of Inductance
5. Counterelecteomotive Force
6. Self-Inductance
7. Types of Inductance
8. Mutual Inductance
9. Inductors in Series or In Parallel
10. Energy Stored in an Inductor

Experiment — Unit 3

Unit 4 – Time Constants

1. Time Constant of RC Circuits
2. Effect of R and C on Charging Time
3. Graphs of Different Charging Times
4. Time Constant T = RC
5. Discharge Current
6. Time Constant of RL Circuit
7. Transient Voltages Produced in an RL Circuit
8. Universal Time Constant Curve
9. Short and Long Time Constants

Experiment — Unit 4

Unit 5 - Sinusoidal Alternating Current

1. Generation of Sine Waves
2. Definition of Cycle
3. Radian Measure
4. Frequency, Angular Velocity and Period
5. Frequency Spectrum
6. Sine Wave
7. The Oscilloscope and Its Use
8. Peak and Instantaneous Values
9. Average Value of Sine Wave
10. Effective or RMS Value of a Sine Wave
11. Relationship of e and i in Resistive Circuits
12. Power in a Resistive Circuit
13. Vectors and Phasers
14. Polyphase Voltages
15. Nonsinusoidal Waves

Experiment — Unit 5

Unit 6 - Inductive and Capacitive Reactance

1. Inductive Reactance
2. Graph of X L
3. X l in Series and in Parallel
4. Phase Relationship of eL and iL.
5. Power in purely Inductive Circuits
6. Inductor Losses
7. Capacitive Reactance
8. Graph of Xc
9. Xc in Series and in Parallel
10. Phase Relationship of ec and ic
11. Power in Purely Capacitive Circuits

Experiment — Unit 6

Unit 7 - Series and Parallel AC Circuits

1. The j Operator
2. Series RL CIRCUITS
3. Phase Angles
4. Series RC CIRCUITS
5. Impedance
6. Z in Rectangular Natation
7. Voltage in Rectangular Notation
9. Z in Polar Notation
9. Ohm's Law for AC Circuits
10. Series RLC Circuits
11. Parallel RL Circuits
12. Parallel RC Circuits
13. Parallel RLC Circuits
14. Power in AC Circuits
15. Power Factor
16. AC Meters
17. Wattmeters

Experiment — Unit 7

Unit 8 - Tuned Circuits and Resonance

1. Definition of Resonance
2. Series Resonant Circuit
3. Calculating the Resonant Frequency
4. Circuit Q
5. Ideal Parallel Resonant Circuit
6. Practical Parallel Resonant Circuit
7. Analysis of Parallel Resonant Circuits
8. Dampening a Parallel Resonant Circuit
9. Resonance Curve
10. Bandwidth
11. Tuning
12. Bandspreading
13. Multiple Tuned Stages

Experiment — Unit 8

Unit 9 - Filters

1. High-pass Filters
2. Loss-Pass Filters
3. Bandpass Filters
4. Band Rejection Filters
5. Constant-k Filters
6. M-derived Filters
7. Phase Shift Networks

Experiment — Unit 9

Unit 10 - Transformers

1. Transformer Types
2. Transformer Principles
3. Voltage and Current Ratios
4. Transformer Losses
5. Core Types
6. Loading Effect
7. Impedance Transformation
8. Autotransformers
9. Isolation Transformers
10. Radio Frequency Transformers

Experiment — Unit 10

Unit 11 - Network Analysis of AC Circuits

1. Vector Algebra
2. Addition and Subtraction by Vector Algebra
3. Multiplication and Division by Vector Algebra
4. Rectangular to Polar Conversion
5. Polar to Rectangular Conversion
6. Impedance of Series Circuits
7. Impedance of Parallel Circuits
8. Equivalent Series Circuits
9. Conductance, Susceptance, and Admittance
10. Series-Parallel Impedance
11. Thevenon's Theorem for AC Circuits
12. Norton's Theorem for AC Circuits

Experiment — Unit 11

VI. **METHODS OF INSTRUCTION:**

Methods of instruction will be as follows:

1. Lecture/Discussion
2. Demonstration/Discussion
3. Required Reading
4. Laboratory Experiments and Reports
5. Audio/Visual Aids

VII. **METHODS OF EVALUATION:**

Evaluation will be competency based utilizing the following tool:

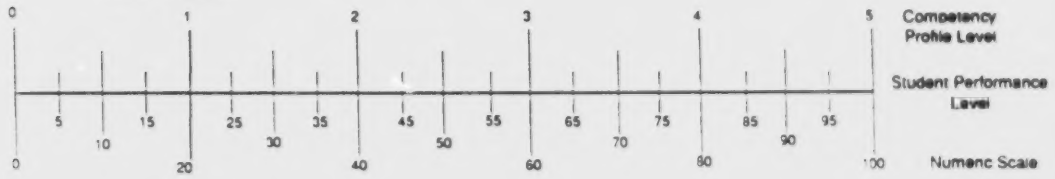
1. Written Examinations
2. Laboratory Experiment Reports
3. Practical Examinations
4. Unannounced Quizzes
5. Daily Observations

VIII. **GRADES:** A letter grade will be awarded to each student according to their numeric standing as outlined below:

90 - 100	A
80 - 89	B
75 - 79	C
70 - 74	D
Below 69	F

A students numeric standing will be determined by the following system:

1. All sub elements of the numeric standing will be based on a raw score of 100.
2. All cognative written examinations will be objective.
3. All competency evaluations will be subjective using the completency based weighted scale below:



Major Written Examinations	=	50%
Laboratory Experiment Reports	=	20%
Major Practical Examinations	=	20%
Unannounced Quizzes	=	5%
Daily Observation	=	5%

Example:

Average mid-term exam and final exam equals 90:	then 90 x .5	=	45
Average lab report grade equals 80:	then 80 x .2	=	16
Average practical grade equals 100:	then 100 x .2	=	20
Average of all unannounced quizzes equals 60:	then 60 x .05	=	3
No deduction for daily observation:	then 100 x .05	=	5
	TOTAL		89

Numeric Score = 89 = B

IX. **STUDENT CONDUCT:**

1. Students are expected to be prompt, courteous, studios, and honest.
2. Make-up work will be allowed for excused absenced only.
3. Reading assignments are to be completed prior to attending associated lecture and/or laboratory sessions as applicable.
4. Note taking is encouraged, but will not be graded.

X. **ADMINISTRATIVE INFORMATION AND/OR REQUIREMENTS:**

A. Lecture
1. Location: Building _____ Room _____
2. Time: Start _____ Stop _____
3. Dates: M _____ Tu _____ W _____ Th _____ F _____ S _____
4. Mid-Term Exam: Mo _____ Date _____ Time _____ Location _____
5. Final Exam: Mo _____ Date _____ Time _____ Location _____

B. Laboratory
1. Location: Building _____ Room _____
2. Time: Start _____ Stop _____
3. Date: M _____ Tu _____ W _____ Th _____ F _____ S _____
4. Mid-Term Practical Exam: Mo _____ Date _____ Time _____ Location _____
5. Final Practical Exam: Mo _____ Date _____ Time _____ Location _____

C. Laboratory Report Schedule

Expenment	Due Date		Expenment	Due Date	
Unit # 1	Mo _____	Date _____	Unit # 7	Mo _____	Date _____
Unit # 2	Mo _____	Date _____	Unit # 8	Mo _____	Date _____
Unit # 3	Mo _____	Date _____	Unit # 9	Mo _____	Date _____
Unit.# 4	Mo _____	Date _____	Unit # 10	Mo _____	Date _____
Unit # 5	Mo _____	Date _____	Unit # 11	Mo _____	Date _____
Unit # 6	Mo _____	Date _____			

D. Instructor:

1. Name: _____

2. Location: Building _____ Room _____

3. Phone: 817/668-7731 Ext: _____

4. Office Hours:

Monday	_____	to	_____
Tuesday	_____	to	_____
Wednesday	_____	to	_____
Thursday	_____	to	_____
Friday	_____	to	_____

NOTE: Students are encouraged to visit during office hours, and other times of opportunity, to resolve problems of any nature.

Gainesville Independent School District has developed an experimental course: DIGITAL LOGIC CIRCUITS, contained herein. This course is designed to enable students to master knowledges, skills and competencies in support of the 2 + 2 electronics program with Cooke County College. The district submits the following as a request for approval:

(I) description of the course and its elements or objectives;

This is a competency based course of study which will contain the following specific bodies of knowledge and skills to be defined and learned: digital integrated logic fundamentals and circuit applications, which includes digital numbering systems, binary mathematics, Boolean Algebra, combination logic circuits and incremental logic circuits. Emphasis will be placed on integrated circuit identification, specification and design consideration for TTL, ECL and CMOS devices. Test instruments, diagnostic procedures and troubleshooting techniques will be developed as an integral requirement of the course. Digital Logic Circuits will meet for one hour per day for both semesters of the school year and will count as one credit.

Digital Logic Circuits (1 unit) shall include the trade and industrial education elements and the following essential elements. The student shall be provided opportunities to:

(1) name the advantages, disadvantages and major differences among analog and digital systems;

(2) convert between decimal and binary numbers;

(3) identify typical digital signals;

(4) convert from the hexadecimal system to either the decimal or binary number systems;

(5) describe the operation of and construct the truth tables for the AND, NAND, OR and NOR gates;

(6) draw and interpret logic circuits and symbols;

(7) design logic circuits with and without the help of a truth table;

(8) use basic troubleshooting rules of digital systems;

(9) construct and analyze the operation of a latch flip-flop made from NAND or NOR gates;

(10) troubleshoot various types of flip-flop circuits;

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(11) perform binary addition, subtraction, multiplication and division on two binary numbers;

(12) describe the basic operation of an arithmetic logic unit;

(13) describe some of the operations performed by an arithmetic processing unit;

(14) understand several types of schemes to decode different types of counters;

(15) recognize and understand the operation of various types of registers;

(16) read and understand digital IC terminology as specified in manufacturer's data sheets;

(17) use a logic pulser and current tracer as digital troubleshooting tools;

(18) utilize the observation/analysis technique for troubleshooting digital circuits;

(19) read and understand the various digital-to-analog converters manufacturer specifications;

(20) understand and correctly use the terminology associated with memory systems;

(21) outline the steps that occur when the central processing unit reads to or writes to memory;

(22) describe the basic characteristics of various types of magnetic memory devices; and

(23) describe the function and operation of each one of the five elements of any computer organization.

(II) rationale and justification for the request in terms of student need:

Digital Logic Circuits is intended to support the 2 + 2 Electronics Technology program being implemented with Gainesville ISD and Cooke County College. The same syllabus will be used by both institutions. The high school student could receive college credit (at his/her option) for this course by fulfilling the necessary requirement as stated in the articulation agreement with Cooke County College. Digital Logic Circuits is an elective with no prerequisite.

(III) description of activities, major resources and materials to be used

This course will provide a thorough and practical study of Digital electronics and the circuits that use them. Demongtration of real-world problem solving and trouble-shooting techniques will test students' understanding of the material. Resource material is to include:

Digital Systems (fourth edition)
Ronald J. Tocci
Prentice Hall, Inc., 1988
ISBN 0-13-213034-3

NIDA Lab-Text Manual and card sets for Digital Circuits, to accompany existing NIDA console equipment.

(IV) methods for evaluating student outcomes;

Evaluation will be competency based utilizing the enabling objectives as the competencies and chapter exams with the following grading scale:

90 - 100	A
80 - 89	B
75 - 79	C
70 - 74	D
below 69	F

(V) qualifications of teacher;

(1) Bachelor's degree with a minimum of three years full time wage earning experience in the occupational area to be taught.
(2) High school graduate with a minimum of five years full time wage earning experience in the occupational area to be taught.

(VI) school years for which approval is requested;

(1) 1990-91
(2) 1991-92
(3) 1992-93
(4) 1993-94

2 + 2 ELECTRONICS PROJECT
REFERENCE TEXT

A C ELECTRONICS
Philip Wheeler
1988
Heath Company
ISBN 0-87119-137-7

A C ELECTRONICS/INSTRUCTORS GUIDE

A C ELECTRONICS/STUDENT WORKBOOK
ISBN 0-87119-148-2

ADVANCED ALGEBRA
Thomas J. McHale & Paul T. Witzke
1972
Addison-Wesley Publishing Company
ISBN 0-201-04633-4

ANALOG SWITCH AND IC PRODUCT DATA BOOK
January 1982
Siliconix Incorporated

APPLIED ALGEBRA (1) I
Thomas J. McHale & Paul T. Witzke
1979
Addison-Wesley Publishing Company
ISBN 0-201-04767-5

APPLIED ALGEBRA (2) II
Thomas J. McHale & Paul T. Witzke
1980
Addison-Wesley Publishing Company
ISBN 0-201-04775-6

APPLIED TRIGONOMETRY
Thomas J. McHale & Paul T. Witzke
May 1985
Addison-Wesley Publishing Company
ISBN 0-201-04723-3

BASIC ALGEBRA
Thomas J. McHale & Paul T. Witzke
June 1971
Addison-Wesley Publishing Company
ISBN 0-201-04625-3

BASIC ELECTRICITY TEXT LAB MANUAL
Fifth Edition
Paul B. Zbar
1983
McGraw-Hill
ISBN 0-07-072801-1

BASIC ELECTRONICS
Fifth Edition
Bernard Grob
1984
McGraw-Hill Book Company
ISBN 0-07-024928-8

BASIC PROGRAMMING FOR SCIENTISTS AND ENGINEERS
Wilbert N. Hubin
1978
Prentice-Hall, Inc.
ISBN 0-13-066480-4

BASIC TECHNICAL MATHEMATICS WITH CALCULUS
Fourth Edition
Allyn J. Washington
1985
The Benjamin\Cummings Publishing Company, Inc.
ISBN 0-8053-9545-8

BASIC TRIGONOMETRY
Thomas J. McHale & Paul T. Witzke
1971
Addison-Wesley Publishing Company
ISBN 0-201-04631-8

CALCULATOR DECISION MAKING SOURCEBOOK
Texas Instruments
ISBN 0-89512-014-3

CIRCUIT ANALYSIS/INSTRUCTORS MANUAL
Irving L. Kasow
1988
John Wiley & Sons, Inc.
ISBN 0-471-63640-1

D C ELECTRONICS
Karl Wojcikiewicz & Jim Fry
1987
Heath Company
ISBN 0-87119-058-3

D C ELECTRONICS STUDENT WORKBOOK
Philip Wheeler
1978
Heath Company
ISBN 0-87119-126-1

DC ELECTRONICS INSTRUCTORS GUIDE
Phillip Wheeler
1988
Heath Company

DESCRIPTIVE GEOMETRY VIA MICROCOMPUTER
J.J.McNeary, R.F. Perras, D.J. Whealon
1985
Kendall/Hunt Publishing Company
ISBN 0-8403-3661-6

DESIGN, DRAFTING AND CONSTRUCTION PRACTICES FOR ELECTRONICS
Cortland C. Doan
1985
Breton Publishers
ISBN 0-534-04722-X

DIGITAL COMPUTER ELECTRONICS
Second Edition
Albert Paul Malvino, PhD.
1983
McGraw-Hill Book Company
ISBN 0-07-039901-8

DIGITAL COMPUTER ELECTRONICS/EXPERIMENTS
Second Edition
Michael A. Miller
McGraw-Hill Book Company
ISBN 0-07-039902-6

DIGITAL ELECTRONICS
Second Edition
John D. Kershaw
1983
Breton Publishers
ISBN 0-534-01471-2

DIGITAL ELECTRONICS/ACTIVITIES MANUAL
Second Edition
Roger L. Tokheim
1984
McGraw-Hill
ISBN 0-07-064981-2

DIGITAL ELECTRONICS TEACHER'S MANUAL
Second Edition
Roger L. Tokheim
1984
ISBN 0-07-064982-0

DIGITAL SYSTEMS PRINCIPALS AND APPLICATIONS
Fourth Edition
Ronald J. Tocci
1988
Prentice-Hall, Inc.
ISBN 0-13-213034-3

DIGITAL TECHNIQUES BOOK 1
Jim Fry
1978
Heath Company
ISBN 0-87119-118-0

DIGITAL TECHNIQUES BOOK 2
Jim Fry
1978
Heath Company
ISBN 0-87119-118-0

DIGITAL TECHNIQUES BOOK STUDENT WORKBOOK
ISBN 0-87119-119-9

DIGITAL TECHNOLOGY/INSTRUCTORS GUIDE
Second Edition
Gerald E. Williams, P.E.
1982
Science Research Associates
ISBN 0-574-21557-3

ELECTRICITY ELECTRONICS FUNDAMENTALS LAB MANUAL
Third Edition
Paul B Zbar & Joseph G. Sloop
1986
McGraw-Hill Book Company
ISBN 0-07-072817-8

ELECTRICITY PRINCIPLES AND APPLICATIONS MANUAL
Second Edition
Richard J. Fowler
1984
McGraw-Hill
ISBN 0-07-021708-4

ELECTRONIC CIRCUITS
Jim Fry
1978
Heath Company
ISBN 0-87119-143-1

ELECTRONIC CIRCUITS/INSTRUCTORS GUIDE

ELECTRONIC FUNDAMENTALS
Philip E. Wheeler
1989
Heath Company
ISBN 0-87119-188-1

ELECTRONIC INSTRUMENTS AND MEASUREMENTS
Larry D. Jones, A. Foster Chin
1983
John Wiley & Sons, Inc.
ISBN 0-471-04520-9

ELECTRONIC TECHNIQUES: SHOP PRACTICES AND CONSTRUCTION
Second Edition
Robert S. Villanucci, Alexander W. Autgis, William F. Megow
1981
Prentice-Hall, Inc.
ISBN 0-13-252486-4

IBM-PC ASSEMBLY LANGUAGE
First Printing
Samuel A. Solomon
1984
Reston Publishing Company
ISBN 0-8359-3032-7

INDUSTRIAL ELECTRONICS TEXT LAB MANUAL
Third Edition
Paul B. Zbar
1981
McGraw-Hill
ISBN 0-07-072793-7

INDUSTRIAL FLUID POWER TEXT VOLUME (1) I
Second Edition
Hedges and Womack
1977
Womack Educational Publications
ISBN 66-28254

INSIDE THE IBM PC REVISED AND ENLARGED
Peter Norton
1986
Prentice-Hall, Inc.
ISBN 0-13-467325-5

INSTRUMENTATION: TRANSDUCERS, EXPERIMENTATION, AND APPLICATION
First Edition
Roger W. Prewitt & Stephen W. Fardo
1979
Howard W. Sams & Co., Inc.
ISBN 0-672-21601-9

INTEGRATED CIRCUITS DATA BOOK
First Edition
1985
Siliconix, INC.

INTERMEDIATE ALGEBRA PROGRAMMED
Thomas McHale, Allan A. Christenson, Keith J. Roberts
1986
Addison-Wesley Publishing Company
ISBN 0-201-15880-9

INTRODUCTORY ALGEBRA PROGRAMMED
Second Edition
Thomas J. McHale, Allan A. Christenson, Keith J. Roberts
May 1988
Addison-Wesley Publishing Company
ISBN 0-201-15887-6

INTRODUCTORY DC/AC ELECRONICS
Nigel P. Cook
1989
Prentice-Hall, Inc.
ISBN 0-13-500026-2

INTRODUCTORY DC/AC ELECTRONICS/INSTRUCTORS RESOURCE MANUAL
Nigel P. Cook
1989
Prentice-Hall, Inc.
ISBN 0-13-500042-4

INTRODUCTORY ELECTRONIC DEVICES AND CIRCUITS
Robert T. Paynter
1989
Prentice-Hall, Inc.
ISBN 0-13-823261-X

INTRODUCTORY ELECTRONIC DEVICES AND CIRCUITS/STUDENT STUDY GUIDE
Clive D. Menezes
1989
Prentice-Hall, Inc.
ISBN 0-13-823543-0

INTRODUCTORY ELECTRONIC DEVICES AND CIRCUITS/INSTRUCTORS TRANSPARENCY MASTERS MANUAL
ISBN 0-13-823733-6

INTRODUCTORY ELECTRONIC DEVICES AND CIRCUITS/INSTRUCTORS RESOURCE MANUAL
ISBN 0-13-823386-1

INTRODUCTORY ELECTRONIC DEVICES AND CIRCUITS/INTSTRUCTORS TEST ITEM FILE
ISBN 0-13-823378-0

INTRODUCTORY ELECTRONIC DEVICES AND CIRCUITS/ LAB MANUAL
Robert T. Paynter
1989
Prentice-Hall, Inc.
ISBN 0-13-823402-7

INVESTIGATIONS IN ELECTRIC POWER TECHNOLOGY
Theodore Wildi & Michael J. DeVito
1986
Buck Engineering Company, Inc.

MICROCOMPUTER ELECTRONICS
Daniel L. Metzger
1989
Prentice-Hall, INc.
ISBN 0-13-579871-X

MICROPROCESSOR TECHNOLOGY
John D. Kersnaw
1981
Breton Publishers
ISBN 0-534-00748-1

MICROPROCESSORS BOOK 1
1985
Heath Company
ISBN

MICROPROCESSORS BOOK 2
1985
Heath Compnay
ISBN 0-87119-105-9

MICROPROCESSORS/INSTRUCTORS GUIDE

MICROPROCESSORS/STUDENT WORKBOOK
ISBN 0-87119-106-7

PERSONAL COMPUTER OPERATION & TROUBLESHOOTING
Roger M. Kersey
1989
Prentice-Hall, Inc.
ISBN 0-13-657495-5

PRACTICAL ELECTRICITY & ELECTRONICS VOLUME (1)I
First Edition
Buck Engineering, Inc.
1982
Lab-Volt
TM 17827

PRACTICAL ELECTRICITY & ELECTRONICS VOLUME (2)II
First Edition
Buck Engineering, Inc.
1982
Lab-Volt
TM 17828

PRACTICAL ELECTRICITY & ELECTRONICS VOLUME (3)III
First Edition
Buck Engineering, Inc.
1982
Lab-Volt
TM 17829

PRACTICAL ELECTRICITY & ELECTRONICS VOLUME (4) IV
Second Edition
Staff of Buck Engineering Co., Inc.
July 1987
Lab Volt
TM 17830

PRACTICAL ELECTRICITY & ELECTRONICS VOLUME (5) V
First Edition
Staff of Buck Engineering Co., Inc.
June 1983
Lab Volt
TM 17831

PRINCIPLES OF INTEGRATED ELECTRONICS
Edward Pasanow
1982
Breton Publishers
ISBN 0-534-01055-5

PROGRAMMABLE CONTROLLER ASSEMBLY AND INSTALLATION MANUAL
Allen-Bradley
1979
Allen-Bradley Company
Bulletin #1772-820

PROGRAMMABLE CONTROLLER PROGRAMMING AND OPERATION MANUAL
Allen-Bradley
1980
Allen-Bradley Company
Bulletin # 1772-821

ROBOTICS AN INTRODUCTION
Douglas R. Malcolm, Jr.
1985
Breton Publishers
ISBN 0-534-04752-1

ROBOTICS AND INDUSTRIAL ELECTRONICS BOOK 1
First Printing
1983
Heath-Zenith Educational Systems
EB 1801-595-3009

ROBOTICS AND INDUSTRIAL ELECTRONICS BOOK 2
First Printing
1983
Heath-Zenith Educational Systems
EB 1801-595-3009

SEMICONDUCTOR DEVICES\INSTRUCTORS GUIDE

SEMICONDUCTOR DEVICES\STUDENT WORKBOOK
ISBN 0-87119-145-8

SIMPLE INTERFACING PROJECTS
Owen Bishop
1983
Prentice-Hall, Inc.
ISBN 0-13-811091-3

TECHNICAL MATHEMATICS (1) I
Thomas J. McHale, Paul T. Witzke
1988
Addison-Wesley Publishing Company
ISBN 0-201-15408-0

TECHNICAL MATHEMATICS (2) II
Thomas J. McHale and Paul T. Witzke
1988
Addison-Wesley Publishing Company
ISBN 0-201-15409-9

TELEVISION ELECTRONICS
Eighth Edition
Milton S. Kiver, Milton Kaufman
1983
Delmar Publishers, Inc.
ISBN 0-8273-1328-4

TESTS FOR TECHNICAL MATHEMATICS (1) I
Thomas J. McHale & Paul T. Witzke
1988
Addison-Wesley Publishing Company
ISBN 0-201-15415-3

TESTS FOR TECHNICAL MATHEMATICS (2) II
Thomas McHale & Paul T. Witzke
1988
Addison-Wesley Publishing Company
ISBN 0-201-15410-2

TESTS SUPPLEMENT A COMPREHENSIVE REFERENCE FOR ASSESSMENTS IN PSYCHOLOGY, EDUCATION AND BUSINESS
Richard C. Sweetland PhD. Daniel J. Keyser. PhD.
1984
ISBN 0-9611286-4-X

TRANSISTOR CIRCUIT APPROXIMATIONS
Second Edition
Albert Paul Malvino. PhD.
1973
McGraw Hill Book Company
ISBN 0-07-039858-5

UNIFIED TECHNICAL CONCEPTS APPLICATION MODULES VOLUME (1) I
Second Edition
1986
The Center for Occupational Research and Development

UNIFIED TECHNICAL CONCEPTS - APPLICATION MODULES VOLUME (1)I
Second Edition
The Center for Occupational Research and Development
1986
Cord
ISBN 1-55502-280-4

UNIFIED TECHNICAL CONCEPTS-APPLICATION MODULES VOLUME (2)II
The Center for Occupational Research and Development
1983
Cord

UNIFIED TECHNICAL CONCEPTS-PHYSICS FOR TECHNICIANS
Second Edition
The Center for Occupational Research and Development
1987
Cord
Library of Congress card # 83-71908

VLSI DATA BOOK
First Edition
TRW
1984
LSI Products Division. TRW ELectronic Components Group

while still in high school, go ahead and satisfy that requirement for an extra six hours needed at CCC to make the 15 high school hours in electronics count as college credit. In other words, an electronics student could conceivably finish high school with 21 full hours of transferable college credit already earned.

Q. Do I have to pay college tuition and fees for the 2+2 Electronics program courses I take in high school?

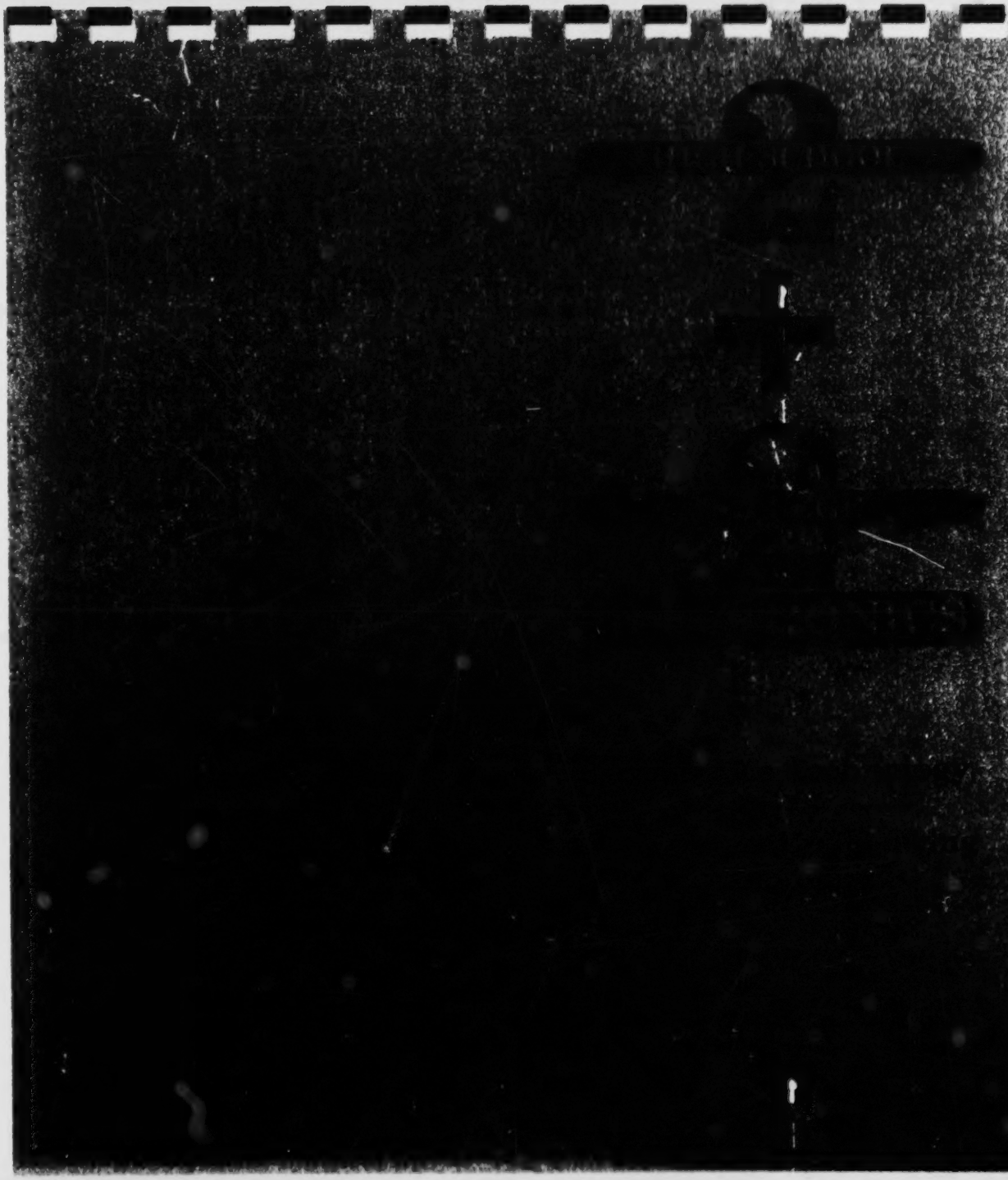
A. No, but you *do* have to pay regular college tuition and fees for any *concurrent enrollment* or *early admissions* courses you take in high school for college credit.

A Message To Non-High School Students Who Would Like To Study Electronics At CCC

Although this brochure is aimed primarily at middle school and high school students, it should be clearly understood that Cooke County College also will be offering vocational-technical programs in electronics for persons past high school age.

The courses of study will be very similar to those described here for students enrolling in the 2+2 program, except that the first semester (and possibly a summer session) would be devoted to the basic math courses and electronics fundamentals courses the 2+2 students would take as high school juniors and seniors.

Students entering the program as college freshmen would work toward the same two-year Associate of Applied Science degree in either Electronics Technology or Electronics Engineering Technology.



Cooke County College
Gainesville Public Schools

2+2 ELECTRONICS

There is no doubt that we are living in an electronic age. Electronics technology touches all our lives every day — probably every minute of every day.

And the rapid development of new electronically controlled devices — from lightning fast, postage stamp-sized calculators to the computerized telemetry systems which guide space ships to the far reaches of our solar system — shows no sign of slowing down. An important result is the creation of thousands of new vocational and career fields that didn't even *exist* only about a decade ago.

Only one thing stands between you and a career in the exciting, high-tech world of electronics — the right kind of education/training.

Start Your Training As A High School Junior

That's right, thanks to a unique new program being offered jointly by Cooke County College and the Gainesville Independent School District, you can begin the crucially important math component of your formal training for a career in electronics in your junior year of high school. Through a special "articulation agreement*," CCC and GISD will offer students the opportunity to get *four full years* of electronics training — two in high school plus two in college.

This "2+2" program gives students two options to choose from depending upon their career goals:

*You may see or hear this word "articulation" used often in reference to the 2+2 Electronics program and especially to individual courses. It simply means that CCC and GISD have a formal, binding written agreement to jointly offer the program, each teaching certain specified courses on a cooperative basis.

Electronics Technology Program

This program, which earns graduates a two-year Associate of Applied Science degree, is designed to prepare students for immediate entry into the job market. Upon completion of the high school portion of the program, students should be qualified for semi-skilled, entry-level positions above minimum wage. Upon completing the second year of college-level studies, in which state-of-the-art electronics technology will be stressed, students should be qualified to enter the work force at a skilled technician level in career fields requiring a broad base of electronics knowledge, such as:

- Electronics manufacturing
- Technical writing
- Electronics installation & servicing
- New product development

Electronics Engineering Technology Program

Students completing this program will receive the same state-of-the-art electronics training (and the same AAS degree) as those completing the Electronics Technology program described above. In addition, however, they will have *more transfer credit* for continuing their education to at least the four-year bachelor of science degree level in Electronics Engineering at a senior college or university. This additional education and training, of course, also increases earning potential.

Questions & Answers For High School Students

Q. Is this program aimed mostly at male students?

A. Not at all. In fact, electronics is a great career field for both men *and* women, with wide ranging job opportunities available to both.

Q. Do I need to be pretty good in math to get into this program?

A. Yes. It is a simple fact that a strong math background is an absolute necessity for anyone working in the field of electronics — simply because so much of electronics theory is mathematically based. The first courses you'll be taking in this program as a tenth grader are math courses – Technical Algebra and Trigonometry. Students in lower grades who have sights set on a career in electronics should work especially hard to build a strong foundation in math.

Q. Exactly how much electronics training will I get in high school?

A. You'll earn a total of 15 semester hours (in college terminology) which translates to five separate courses – two in math and three in electronics.

Q. Will I get high school credit or college credit (or both) for these courses?

A. You will earn full high school credit that will count toward graduation. In addition, these credit hours will be "held in escrow" for you at Cooke County College. To get them counted as college credit, you must enroll at CCC and complete six *additional* college credit hours. When you've done so, those first 15 hours will be "applied to your account," so to speak, and you will have a total of 21 hours of college credit (which, if you wish, can be transferred to any other college of your choice).

And here's another option: CCC also offers (separate and apart from the 2+2 Electronics program) a program called "concurrent enrollment" or "early admissions" through which students can (with permission) enroll in certain college-level courses and earn college credit *while still in high school*.

The bottom line is that a student can, by *concurrently* enrolling in other college courses

This CD* Will Make You Sound Great

. . .To Potential Employers.

Look around you — where you live, where you study, where you play (as well as at how you get to all those places). How many things do you see that are operated or controlled *electronically*? It's hard to imagine our world today without electronics – there'd certainly be no compact disc players like the one pictured above (or even an "old-fashioned" turntable stereo), no computers, no television, no VCRs, no telephones, no hand-held calculators, not even electric lights. So. . .

*Turn Your Career Direction Toward

ELECTRONICS

It's THE Career Choice For The 90s And Beyond. Juniors Can Start Preparing Right Now At GHS!

That's right, as a junior, you CAN start preparing for a *well-paying* career in electronics right here at Gainesville High School, and – through the special Two-Plus-Two Program between GHS and Cooke County College – be ready to go to work as an Electronics Technician in just four years!

Or, in that same time, you can get a huge head start on more advanced study needed to become an Electronics Engineer. You see, that's one of the great things about studying for a career in electronics — good jobs are available (and getting more plentiful all the time) at just about any level, from reparing and servicing TVs, VCRs and computers to *designing and building* them and every other electronically controlled device you can imagine from radios to space ships. In addition:

- Although electronics does require a strong preparation in math, it's not nearly as difficult to learn as you might think.
- The electronics program is not traditional education, it is *career* education.
- You will be learning skills that will enable you to *get a job* in today's high-tech world.
- Electronics allows you to work with your hands as well as your head – usually in a clean, safe environment.
- Technology will continue to expand, and there will *always* be good job opportunities for those who are trained in electronics, especially those willing to keep on learning.

One thing is sure — in the 1990s and beyond, specialized education and training, whether you get it in college or a commercial trade or vocational school, will be an absolute must for those who don't want to be locked in to a dead-end job at minimum wage. With electronics, you don't have to wait to finish high school before beginning a college or vocational school program. You can start preparing for your future RIGHT NOW!

For more details, see your Counselor today!

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ELECTRONICS
COOKE COUNTY COLLEGE

ELECTRONICS TECHNOLOGY • ELECTRONICS ENGINEERING TECHNOLOGY

A New Age Means New Job Opportunities

There is no doubt that we are living in an exciting new age – an electronic age. Electronics technology touches all our lives every day – probably every minute of every day.

And the rapid development of new electronically controlled devices – from lightning fast calculators the size of a postage stamp to the computerized telemtry systems which guide space vehicles – shows no sign of slowing down. An important result is the creation of thousands of new jobs that didn't even *exist* only about a decade ago.

The vast majority of those new job opportunities exist because of two things that haven't changed since Edison's day, and probably never will: (1) *that there is a constant demand for newer, better devices/systems, and* (2) *that even the most sophisticated electronic devices need maintenance and occasional repair.*

Only one thing stands between you and a career as a well-paid professional who's equipped to meet either or both of these needs – the right kind of education and training.

CCC Program Offers Two Training Options

Students studying electronics at Cooke County College can choose between two training program options – either **Electronics Technology** or **Electronics Engineering Technology.**

The basic difference between them is that Electronics Technology is for students who wish to enter the job market immediately upon completion of the two-year program, whereas Electronics Engineering Technology is meant for students who intend to continue studying toward at least a bachelor's degree. More math is required for the Electronics Engineering Technology program, but the actual electronics courses for both programs are identical. ***(Refer to "Engineers, Technologists & Technicians – Who Does What?" on page 3.)***

Following is more specific information about each of the two training options:

ELECTRONICS TECHNOLOGY

This two-year Associate of Applied Science degree program is designed to prepare graduates for immediate entry into the job market as ELECTRONICS TECHNICIANS. Upon completion of the program, graduates will have a solid, broad-based foundation of electronics knowledge and should be qualified for many different types of jobs requiring such knowledge.

Suggested Two-Year Program Of Study

		CR	LEC	LAB	CH
FRESHMAN YEAR					
Fall Semester					
EL 1103	DC Circuit Analysis	3	48	48	96
EL 1403	Digital Logic Circuits	3	48	48	96
MA 1363	Technical Algebra	3	48	0	48
EN 1043	Grammar & Composition	3	48	0	48
DT 1113	Engineering Drafting	3	16	64	80
	Totals*	**15**	**208**	**160**	**368**
Spring Semester					
EL 1203	AC Circuit Analysis	3	48	48	96
EL 1303	Semiconductor Circuits	3	48	48	96
EL 2203	Computer & Peripheral Maint.	3	48	48	96
MA 1373	Technical Trigonometry	3	48	0	48
CS 1114	Introduction to Programming	3	48	32	80
	Totals*	**16**	**240**	**176**	**416**
SOPHOMORE YEAR					
Fall Semester					
EL 1503	Microprocessor Architecture	3	48	48	96
EL 2103	Adv. Circuits & Instrumentation	3	48	48	96
EN 1053	Literature and Composition	3	48	0	48
DT 2133	Electronics Drafting	3	16	64	80
PH 1223	Unified Tech Concepts (Physics)	3	48	16	64
	Totals*	**15**	**208**	**176**	**384**
Spring Semester					
EL 1603	Microprocessor Interfacing	3	48	48	96
EL 2603	Electronics Fabrication Project	3	16	80	96
EN 2303	Program. Controllers/Robotics	3	48	48	96
DT 2503	Industrial Maint. & Motors	3	48	48	96
GO 2443	American, State & Local Govt.	3	48	0	48
	Totals*	**15**	**208**	**224**	**432**
Associate of Applied Science Degree	**TOTAL***	**61**	**864**	**736**	**1600**

*** CR = Credit Hours, LEC = Lecture Hours, LAB = Laboratory Hours, CH = Clock Hours**

Electronics Engineering Technology

This two-year Associate of Applied Science degree program is for students who plan to pursue advanced studies at a senior college or university, with the goal of at least a bachelor's degree in Electronics Engineering Technology (see page 3).

FRESHMAN YEAR					
Fall Semester		**CR**	**LEC**	**LAB**	**CH**
EL 1103	DC Circuit Analysis	3	48	48	96
EL 1403	Digital Logic Circuits	3	48	48	96
MA 1113	College Algebra	3	48	0	48
EN 1043	Grammar & Composition	3	48	0	48
DT 1113	Engineering Drafting	3	16	64	80
	Totals*	**15**	**208**	**160**	**368**
Spring Semester					
EL 1203	AC Circuit Analysis	3	48	48	96
EL 1303	Semiconductor Circuits	3	48	48	96
EL 2203	Computer & Peripheral Maint.	3	48	48	96
MA 1123	College Trigonometry	3	48	0	48
EN 1053	Literature and Composition	3	48	0	48
CS 1114	Intro to Programming OR:				
CS 1124	Computer Programming (Pascal)	4	48	32	80
	Totals	**19**	**288**	**176**	**464**
SOPHOMORE YEAR					
Fall Semester					
EL 1503	Microprocessor Architecture	3	48	48	96
EL 2103	Adv. Circuits & Instrumentation	3	48	48	96
EN 2063	Technical Writing	3	48	0	48
DT 2133	Electronics Drafting	3	16	64	80
MA 2114	Calculus I	4	48	32	80
	Totals	**16**	**208**	**192**	**400**
Spring Semester					
EL 1603	Microprocessor Interfacing	3	48	48	96
EL 2603	Electronics Fabrication Project	3	16	80	96
EN 2303	Program. Controllers/Robotics	3	48	48	96
DT 2503	Industrial Maint. & Motors	3	48	48	96
GO 2443	American, State & Local Govt.	3	48	0	48]
PH 1314	General Physics OR:				
PH 2214	Engineering Physics	4	48	48	96
	Totals	**19**	**256**	**272**	**528**
Associate of Applied Science Degree:	**TOTAL**	**69**	**960**	**800**	**1760**

COURSE DESCRIPTIONS

EL 1103 DC Circuit Analysis — **3 hours**
Pre/Corequisites: MA 1363 or MA 1113
48 lecture hours – 48 laboratory hours

A competency based course in DC circuits which includes theory and applications of OHM's law, Kirchhoff's laws, Millman's laws, and network theorems relative to the distribution of DC current, resistance, voltage and power in series parallel resistive circuits. Component identification and specifications of conductors, insulators and resistors will be stressed along with the use of DC test instruments.

EL 1203 AC Circuit Analysis — **3 hours**
Prerequisites: EL 1103
Corequisites: MA 1373 or MA 1123,.
48 lecture hours – 48 laboratory hours

A competency based course in AC circuits which includes theory and applications in magnetism, inductance, capacitance, and L-C-R networks relative to the distribution of AC current, impedance, voltage and power in series. Parallel L-C-R circuits. Particular emphasis will be placed on the effects of frequency on transformer filters and resonant circuits. Component identification and specifications will be stressed along with the use of DC and AC instruments.

EL 1303 Semiconductor Circuits — **3 hours**
Prerequisites: EL 1203
48 lecture hours – 48 laboratory hours

A competency based course in discrete and integrated solid state current and voltage controlling devices, which includes theory of atomic structure and applications in biasing of diodes, bipolar transistors, field effect transistors, and integrated circuits. Current and/or voltage amplification characteristics, isolation, feedback of each device as well as circuit configurations will be emphasized. Troubleshooting techniques will be developed as an integral requirement of this course as well as the continued use of test instruments.

EL 1403 Digital Logic Circuits — **3 hours**
Prerequisites: EL 1103
48 lecture hours – 48 laboratory hours

A competency based course in digital integrated logic fundamentals and circuit applications, which includes digital numbering systems, binary mathematics, Boolean algebra, combination logic, circuits and incremental logic circuits. Special emphasis is placed on integrated circuit identification, specification and design consideration for TTL, ECL, and CMOS devices. Test instruments and diagnostic procedures will be stressed.

EL 1503 Microprocessor Architecture — **3 hours**
Prerequisites: EL 1103, EL 1203
48 lecture hours – 48 laboratory hours

A competency based course in microprocessor architecture, which includes functional internal/external operation and applications of selected 8-bit, 16-bit and 32 bit processor integrated circuits. Machine and assembly language are introduced with emphasis on data movement in and out of the integrated circuit. Additional stress is focused on arithmetic functions, decision logic, data transfer and data storage. Digital troubleshooting techniques will be emphasized.

EL 1603 Microprocessor Interfacing — **3 hours**
Prerequisites: EL 1503
48 lecture hours – 48 laboratory hours

A competency based course in interfacing techniques with emphasis on, state of the art, integrated circuits. Standard peripheral interfacing will be covered as well as custom design consideration. Computer diagnostic and repair techniques will be stressed.

EL 2103 Advanced Circuits and Instrumentation — **3 hours**
Prerequisites: EL 1303
48 lecture hours – 48 laboratory hours

A competency based course in discrete, integrated, and instrumentation circuits which includes pulse circuits, digital circuits, analog circuits and transducers. Emphasis will be on design, function, operation, applications, specification, interfacing and troubleshooting of selected current "state of the art" circuits such as optical isolators, operational amplifiers, ramp generators, voltage controlled oscillators, pulse generators, timing circuits, comparators, converters, transducers and other circuits that come into standard electronics industry usage.

EL 2203 Computer and Peripheral Maintenance — **3 hours**
Prerequisites: EL 1403
Corequisites: EL 2103 or EL 1303
48 lecture hours – 48 laboratory hours

A competency based course in computer and peripheral maintenance techniques which includes theory, design, testing and applications of selected computers and peripheral devices. Emphasis will be on applications, design, compatibility, and reliability factors. Trou-

bleshooting and safety will be stressed.

EL 2303 Programmable Controllers and Robotics 3 hours
Prerequisites: EL 1303
Corequisites: EL 1503, EL 2103
48 lecture hours – 48 laboratory hours

A competency based course in programmable controllers and robotics which includes theory testing and applications of selected programmable controller and robotic systems. The emphasis will be on programming, operation, applications and environmental considerations. Diagnostics for selected programmable controllers and robots, techniques and safety will be stressed.

EL 2503 Industrial Maintenance and Motors 3 hours
Prerequisites: EL 1203
48 lecture hours – 48 laboratory hours

A competency based course in industrial maintenance and motors which includes commercial and industrial power distribution, documentation, electrical codes, motors and plant operations. Special emphasis will be placed on repair, documentation and safety.

EL 2603 Electronics Fabrication Project 3 hours
Prerequisites: EL 1503, EL 2103,
Corequisite: EL 1603
16 lecture hours – 80 laboratory hours

A competency based project designed to enhance general electronics design knowledge, fabrication skill, and develop problem solving abilities. Each student is required to select a project, with the instructor's approval. The student will carry their project from inception to completion, and prepare a formal documentation report on the entire project. The emphasis will be on problems and solutions in planning, implemention, production, and reporting.

Refer to the Cooke County College Catalog for descriptions of academic support courses.

Engineers, Technologists & Technicians — Who Does What?

NOTE: Reference is made to the definition of engineering technology put forth by the Accreditation Board for Engineering Technology (ABET):

In general, there are three main career categories associated with training in Electronics Technology. At the first level is an ***Electronics Technician***, who usually has a two-year associate degree and a broad-based knowledge of electronics basics rather than any particular "specialization."

Most often, these technicians work at maintenance/repair-related jobs. Although they generally go to work immediately after completing their two-year associate degree program, additional self-study or on-the-job training is usually required to enable them to install, maintain, service, trouble-shoot and/or repair *particular brands, types or models* of electronic devices/systems. These could range from such devices as VCRs, personal computers and photocopiers to computerized numerical control systems used in high-tech manufacturing.

An ***Electronics Engineering Technician***, on the other hand, generally *starts* with a two-year associate degree (which requires more math courses than that of the Electronics Technician). Usually (but not necessarily – see below), the graduate goes on to earn at least a bachelor's degree in Electronics Engineering Technology. This is an area of engineering technology which is concerned with the application of electronics for control, communications and computation. A person with a bachelor's degree in this field is called a "technologist."

Electrical Engineering Technologists are often called a production, maintenance or applications "engineers" (although they are not technically engineers). Their most critical function is to work with an engineering team to assure that the production process – from design to finished product – is efficiently implemented and maintained.

Associate degree graduates in Electronics Engineering Technology may choose instead to pursue a higher degree in Electrical Engineering. ***Electrical Engineers*** are responsible for the research and development phases of technical work. Their primary function is to conceptualize, design and graphically or otherwise construct devices, processes or systems which solve a technical problem or create a new product or manufacturing process.

Electronics Engineering Technicians (two-year degree) generally *assist* engineers, scientists and technologists. They may be called upon to perform tasks which range from those of the traditional skilled craftsman or mechanic up to light examples of design engineering. Often, these engineering technicians work in such jobs while studying toward more advanced degrees.

Finally, there are ***Electronics Assemblers***. The purpose of the Electronics Technology program at CCC is NOT to train persons to become assemblers, although graduates would certainly be qualified for such jobs. The assembler or operator's job role is exactly what the name implies. These individuals assemble products or devices or operate equipment of some kind. While the requirements in math and basic skills have increased for these workers, most industries hire high school graduates or less and provide whatever training is necessary for a specific set of tasks.

The essential elements common to all vocational programs are listed below as they are to be introduced, by course, within the program for electronics.

Direct Current Circuit Analysis and
Alternating Current Circuit Analysis

Concepts and skills related to successful employment.

(A) develop an awareness of employment opportunities in chosen field;

(B) practice correct procedures for job application and interview;

(C) develop the ability to take both oral and written directions;

(D) practice punctuality and dependability;

(E) observe rules and standards of the work place

(F) demonstrate an ability to work with others harmoniously;

(G) develop responsibility and the ability to follow through on assigned tasks; and

(H) exhibit productive work habits and attitudes.

Digital Electronics

Leadership concepts and skills.

(A) identify characteristics and responsibilities of leaders and effective group members;

(B) participate in orderly meetings conducted according to parliamentary procedure;

(C) function effectively on committees;

(D) plan and conduct leadership activities; and

(E) prepare for effective citizenship and participation in our democratic society.

Digital Electronics (con't)

Concepts and skills associated with entrepreneurship.

(A) recognize opportunities and options for business ownership.

(B) identify entry-level procedures, planning processes, and terms needed to open a business; and

(C) develop an understanding of the role of small business in the free enterprise system.

The recommended youth organization for this program will be Vocational Industrial Clubs of America.

The VICA organization should be used as the method to teach the following essential elements:

1. Identify characteristics and responsibilities of leaders and effective group members
2. Participate in orderly meetings conducted according to parliamentary procedure
3. Function effectively on committees
4. Plan and conduct leadership activities
5. Prepare for effective citizenship and participation in our democratic society.

Materials that are helpful in organizaing a VICA organization may be purchased from the curriculum center at Texas A & M University. Some materials that might be helpful are:

VICA Leadership Handbook
&
Constitution and By-Laws